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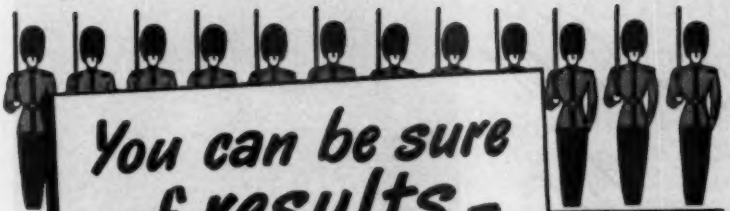

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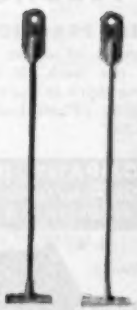

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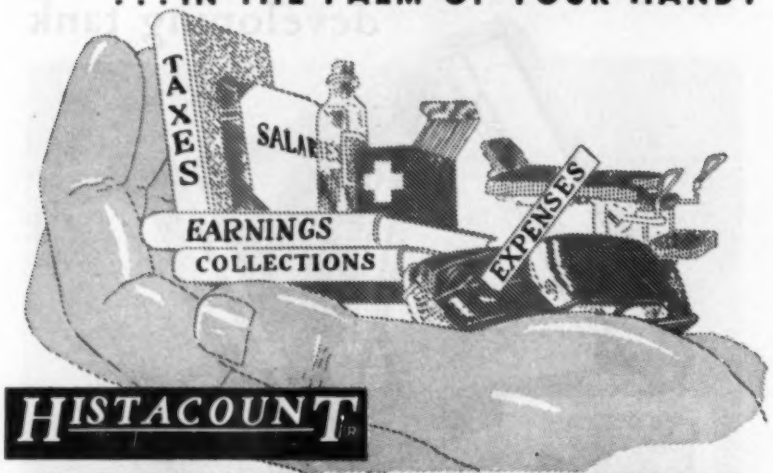

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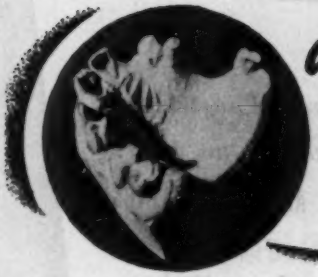

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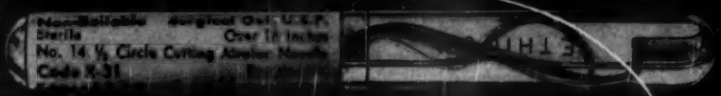

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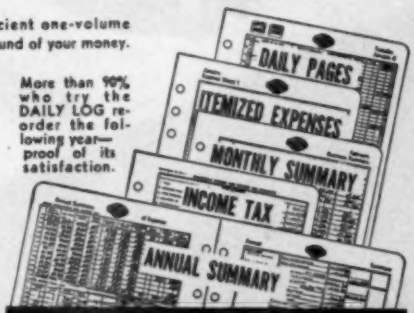

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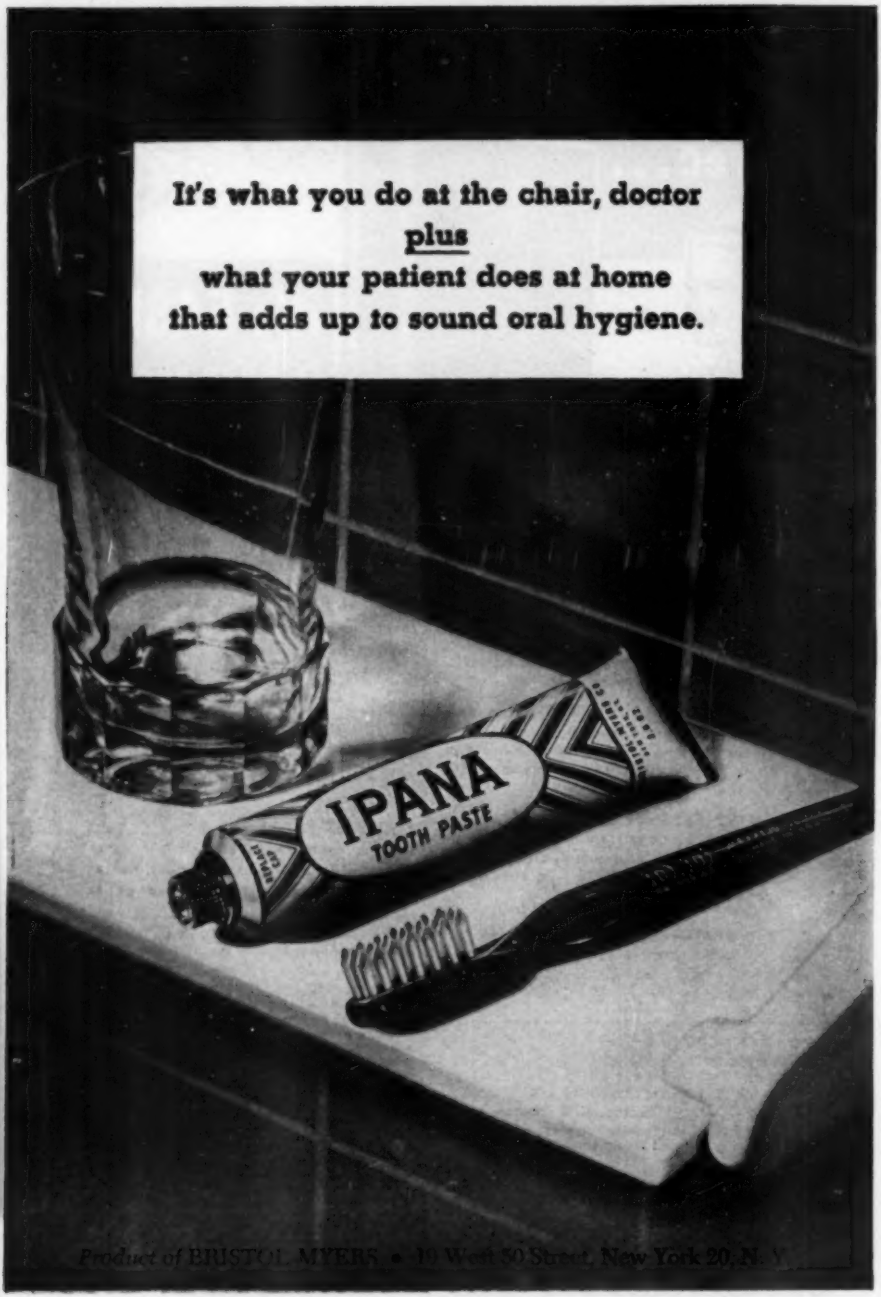
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THE Journal OF THE AMERICAN DENTAL ASSOCIATION

Differential roentgenologic diagnosis for the oral surgeon

Stanley A. Lovestedt, D.D.S., Rochester, Minn.

Intraoral roentgenography provides a third hand for the oral surgeon. It is the procedure most frequently employed for the preoperative and postoperative study of the tissues of the jaws and deserves credit for doing more to alter the nature and character of the work done by oral surgeons than any other aid. Oral roentgenology has reached the status of a specialty within the practice of dentistry. It is not likely that the oral surgeon who has prepared for his specialty in the shortest time possible will have had an opportunity to gain sufficient experience in oral medicine and oral roentgenology to make him an expert, unless in his training he had an opportunity to handle thousands of patients, for each of whom complete physical and medical histories were obtained, tests and examinations were made, consultation, treatment or surgical intervention, or all three, were carried out as indicated, with a follow-up study to demonstrate not only the efficacy of the prescribed treatment but, more important, the correctness of the diagnosis. It may follow, then, that the oral surgeon has as much need of help from the oral roentgenologist as the oral roentgenologist has need of help from the oral surgeon. It is axiomatic that the patient will be served better by the combined efforts of the oral roentgenologist and oral surgeon than by either alone.

The responsibility of obtaining roentgenograms by the generous use of film at different angles, and the use of contrast medium suitable for study, along with other roentgenologic aids to provide a result which is sharp in detail, falls to the roentgenologist. After studying the finished roentgenograms and drawing on his experience, he is able to offer an interpretation of his observations. He must

Read before a joint session of the Section on Roentgenology and the Section on Oral Surgery, ninety-second annual session of the American Dental Association, Washington, D. C., October 16, 1951.

From the section on dentistry, Mayo Clinic, Rochester, Minn.

know the dental system thoroughly, the schedule of formation, eruption and exfoliation of deciduous teeth and the factors which may alter such a schedule, as well as those which are considered normal variations and those which occur as a result of disease. He must know the chronology of the secondary dentition and the normal and pathologic variations. The systemic diseases which are manifested in bone are of tremendous importance to members of the dental profession and here again roentgenologists are of great help. Dental work can be done better with the help of roentgenograms; in fact, some work would not be done if it were not for intraoral roentgenograms. Correct roentgenologic diagnosis depends on a knowledge of the gross pathologic changes which may occur and which are evidenced by changes or deviations from the normal in a roentgenogram.

In dental roentgenologic diagnosis it is important to have clinical experience as well as knowledge of pathology, for the recognition of an abnormal situation in itself is not always sufficient. More nonpathologic variations occur in the jaws than in any other bones. From the time of eruption of the first tooth to the end of life the jaws are subjected to many procedures which in themselves can bring about permanent changes in the radiopacity and the pattern of the bone. Many of these procedures do not occur in other bony tissues. The removal of teeth, the presence of acute or chronic infections all may leave their marks, often in the formation of dense sclerotic bone, frequently referred to as scar bone. The diagnostic usefulness of any roentgenogram has certain limitations. In many instances a definite diagnosis can be suggested from roentgenologic evidence alone, while in others only a tentative diagnosis based on probability can be made. A correct diagnosis of lesions which occur in bone can be arrived at only by biopsy.

Roentgenograms are of particular value if taken in a series showing progression of a systemic or constitutional disease, especially if the first roentgenogram revealed no evidence of change from the normal.

In this paper the landmarks in the jaw of importance to oral roentgenology will be discussed. Some of the lesions of dental origin and those originating in the jaws will be mentioned and their roentgenologic appearance described. Thereafter certain systemic diseases of the endocrine glands and developmental disorders of the skeleton which may cause changes in the teeth and jaws will be considered and their differential diagnoses discussed. The dentist, oral roentgenologist or oral surgeon may find the first clue to some of these diseases in oral roentgenograms or in the condition of the dentition, and a tentative diagnosis can be made.

LANDMARKS

Anatomic landmarks vary from individual to individual, and in the same individual at different ages and under different circumstances. Occasionally anatomic landmarks are hidden by dental structures and, on the other hand, dental structures themselves occasionally are hidden by some of the anatomic landmarks. Variations in the radiolucency of the hard structures of the jaw tend to occur with infection or other pathologic conditions.

The landmarks most frequently used for orientation are those which are easily seen, not only roentgenographically, but clinically. In the maxilla the hamular process, the outline of the tuberosity, the configurations of the maxillary sinus, the midline, the incisive canals, the superior and anterior foramens are all important landmarks. In the mandible, the symphysis and genial tubercle, the mental foramen, the external oblique ridge, internal oblique ridge and mylohyoid line are all important landmarks. Other landmarks are the teeth and the lamina dura.

LESIONS OF LOCAL ORIGIN

Changes of dental origin, such as follicular and radicular cysts, odontomas and cementomas, are visible roentgenographically. Other changes seen in roentgenograms are cysts in the incisive canals and in the angle of the mandible, and giant cell tumors and adamantinoma or ameloblastoma.

In the roentgenogram clearly defined borders surrounding the fibrous sac of a cyst are caused by the pressure of accumulating fluid. The pressure causes an increased density of the bone in this region immediately surrounding the sac. The widespread and almost exclusive reliance on the roentgenogram for the purpose of diagnosing cysts has resulted in many mistaken diagnoses. No diagnosis should be made until a specimen has been studied histologically. Radicular cysts, as well as follicular cysts, grow by osmotic pressure; the surrounding bone is absorbed and the dense radiopaque line appears immediately adjacent to the sac of the cyst. Odontomas in their various forms are somewhat similar to cysts in that they occupy space in the bone but grow by formation of tooth substance within the combining outline membrane. The odontomas may be soft, hard or mixed.

The cementoma, a lesion which occurs more frequently in women than in men, is misdiagnosed probably more often than any other lesion. The cementoma arises at the apical end of a vital tooth. It is radiolucent in its early fibrous stage and radiopaque in its matured stage.

Cysts of unknown etiology occur in the angle of the jaw. They usually occur below the inferior dental canal, are oval or slightly rounded in shape and tend to be well circumscribed, with a rather dense layer of bone. Some of these have been found to be free of any lining or material and hence are called bone cavities in the angle of the mandible.

A cyst which develops rather infrequently is the globulomaxillary cyst. It occurs at the site of union of the globular and maxillary processes and arises from epithelial remnants. It appears in the roentgenogram as a radiolucent area which is usually well circumscribed and is located between the lateral incisor and the cuspid. The cyst may expand to displace both teeth. The teeth, however, retain their vitality and can usually be excluded as the cause of the lesion. For such a lesion to be present after the teeth are removed would prove a diagnostic problem, but if the surgeon had complete roentgenograms available when the teeth were removed, such a growth would not have been overlooked. Therefore, a cyst occurring in an edentulous arch where it had not been present before the teeth were removed would be suggestive of a residual cyst. Giant cell tumor and, in certain parts of the mouth, ameloblastoma should also be considered.

The teeth in the jaws may vary as to size, shape, location, number, structure, rate of development, rate of eruption and time of exfoliation. Without complete oral roentgenograms no opinion can be offered to account for any of the variations. No diagnosis should be made until roentgenographic findings are added to the clinical findings and the history. Successful treatment then may follow a correct diagnosis.

It is particularly helpful to take advantage of roentgenograms which cover a period of a few or several years when diagnosing periodontal disease. However, a diagnosis should not be attempted from roentgenograms alone. Sometimes response to treatment may be seen readily in the intraoral roentgenogram. The character and quality of the supporting bone may be studied from time to time and comparisons made with earlier roentgenograms. Such procedure allows intelligent planning and treatment.

The dental roentgenologic aspect of systemic disease is a subject that has been receiving considerable attention in the

past year or so, and Stafne[1] has reviewed many of the endocrine disturbances as well as some of the developmental disturbances. The risk of operation is often high for patients who have endocrine disturbances. If these disturbances are recognized, the patient's safety usually may be assured because operation will be deferred or the patient will be under the care of a physician and oral surgeon. Even when endocrine disturbances are present, it is possible for certain surgical procedures to be carried out if the patient is properly prepared for the operation.

DISTURBANCES OF ENDOCRINE GLANDS

The endocrine glands are the ductless glands which produce hormones that are secreted into the blood stream and then act as regulators to control or modify growth and metabolism. The dentist plays an unusual role in the study of endocrine diseases for many times teeth tend to reflect the effects of endocrine disturbances with almost kymographic accuracy.

Disturbances of the Pituitary Gland • The pituitary gland, often referred to as the master gland of the body, secretes several hormones, some of which act on other glands, which in turn secrete their own hormones. The pituitary gland may be credited with controlling body growth. Deficiency in pituitary secretion is referred to as hypopituitarism. When it occurs early in life a pituitary dwarf results. In such instances the size of the teeth is not affected although the size of the jaws tends to fit in with the development of the rest of the body.

Overproduction of the hormone causes hyperpituitarism. Hyperpituitarism which occurs early in life—that is, in the first three, four or five years—is characterized by uniform overgrowth of all of the parts of the body, a condition referred to as giantism. If the onset of hyperpituitarism occurs during the juvenile years, a condition of disproportionate growth results which is also a type of giantism. The structures which mature early will not continue to grow; therefore, the disproportion results from the excessive growth of the remaining active growth centers. If hyperpituitarism occurs in the adult, a condition known as acromegaly results. In this condition, there is a growth of those centers which tend to persist in the adult, such as the terminal parts of the fingers, toes, nose and skull. The central feature of the acromegalic change of the skull is the enlargement of the mandible which is called prognathism. The cellular activity seems to be greatest at the sites of formation of endochondral bone. The changes in occlusion are most evident as the mandible grows. The teeth tend to supererupt, and this is followed by apposition of bone at the alveolar crest. The structure of the bone in acromegalic jaws is not altered.

The oral surgeon is particularly interested in pituitary disease because the risk of operation for middle aged patients who are victims of panhypopituitarism is unusually great. It may be that under proper prophylactic treatment elective procedures can be made safe.

Thyroid Disease • The thyroid gland produces thyroxin, a hormone which regulates the metabolic rate, which in turn has an effect on body growth and development. In hypothyroidism there is a deficiency of the secretion of the thyroid gland resulting in retardation of growth. The degree of retardation is dependent on the time of onset of the thyroid disease. When hypothyroidism is present at birth, cretinism is the result. When it occurs during infancy and childhood juvenile myxedema results. Adult myxedema, which occurs with its onset

1. Stafne, E. C. Dental roentgenologic aspects of systemic disease. J.A.D.A. 40:265 (March) 1950.

after puberty, produces no skeletal changes. When hypothyroidism occurs at birth or during the first years of life, growth almost stops in all tissues, and a disproportionately formed individual is the result. The jaws are small and underdeveloped. The deciduous teeth may be lost at a rather late date and there is retarded eruption of the permanent teeth. Development of dental roots may be retarded although there is no great alteration in the final size of the tooth. The crowns of the teeth are not affected. Thyroid dysfunction occurring after the teeth have erupted will leave no mark on the dental structures.

When hyperthyroidism, or a state of hyperfunction of the thyroid gland, occurs in children, skeletal growth, including the development and eruption of the teeth, is accelerated. There occasionally may be osteoporosis. If toxic goiter occurs in an adult, osteoporosis may be produced. The degree of osteoporosis, however, is not a basis for diagnosis of hyperthyroidism since it is not caused by thyroid disease alone.

Parathyroid Disease • The parathyroid glands secrete a hormone which affects the metabolism of calcium and phosphorus and bone.

Hypoparathyroidism • Hypoparathyroidism may appear (1) as neonatal hypoparathyroidism, (2) as hypoparathyroidism following thyroidectomy and (3) as idiopathic or spontaneous hypoparathyroidism at any time in life. If hypoparathyroidism occurs before the dental system has been completed, it will leave its mark on dental structures. This is particularly true if it occurs early enough to interfere with formation of enamel. Hypoparathyroidism is one of the complications which may follow thyroidectomy and is therefore guarded against. After thyroidectomy patients are watched rather closely to see if any symptoms of hypocalcemia develop. In spontaneous or idiopathic hypoparathyroidism which occurs in children or adolescents, the fingernails may become involved, there may be photophobia, absence or sparseness of the eyelashes, and the dental structures undergoing development may be involved. Anaplasia of enamel and shortened root formation have been observed. When hypoparathyroidism occurs early there may be calcification of the cerebral basal ganglion which, according to Camp,[2] is significant in the diagnosis of parathyroid insufficiency.

Hyperparathyroidism • In this disease there is an increased secretion of the parathyroid hormone. It may occur because of an adenoma or other lesion of the parathyroid gland or because of increased cellular activity as a secondary response to some other condition. When all of the bones of the body are involved in the changes caused by hyperparathyroidism, the condition is designated osteitis fibrosa cystica generalisata. Some internists have stressed the importance of the dental roentgenogram as it applies to hyperparathyroidism specifically. For example, Keating[3] has said:

> The technical superiority of roentgenograms of the bone surrounding the teeth, plus the special advantage produced by the uninvolved teeth as a gauge of density make dental roentgenograms particularly useful in the recognition of mild degrees of skeletal involvement. Mild demineralization, early distortion of the trabecular pattern and disappearance of the lamina dura sometimes provide more specific clues to the diagnosis than do changes elsewhere in the skeleton.

In the dental roentgenogram, hyperparathyroidism is indicated by abnormal radiolucency of bone with transformation of the bony tissue into a finely meshed, lacelike trabecular material that resembles ground glass. Areas of fibrosis, where bone trabeculae are practically de-

2. Camp, J. D. Symmetrical calcification of the cerebral basal ganglia; its roentgenologic significance in the diagnosis of parathyroid insufficiency. Radiology 49:568 (Nov.) 1947.

3. Keating, F. R., Jr. Hyperparathyroidism. Am. J. Orthodont. (Oral Surg. Sect.) 33:116 (Feb.) 1947.

stroyed, will appear cystlike in the roentgenogram. Some of these areas of radiolucency may be well circumscribed and tumor formations may be present. The classical dental findings in hyperparathyroidism when bone changes have occurred are loss of anatomic landmarks and absence of lamina dura. The roots of the teeth appear sharpened, not of decreased length, but of decreased width, and end in a fine tapering point. It is unlikely that there would be sufficient involvement as a result of hyperparathyroidism to show complete loss of lamina dura without some other changes being present, too. Some degree of osteofibrosis of the bone is common. This fibrosis accounts for the teeth becoming somewhat loose in their sockets. Whenever giant cell tumors are encountered in the jaw, hyperparathyroidism should be kept in mind. However, giant cell tumors of the jaws are not always associated with hyperparathyroidism. It is not uncommon for an oral surgeon to operate on a giant cell tumor of the jaw and to find later that the patient had an adenoma of the parathyroid gland. Dental roentgenograms show many changes after successful treatment of hyperparathyroidism. Bone in which fibrosis was not too extensive returns to normal, leaving little or no evidence of what has taken place. However, whenever there are considerable trabecular changes, bone pattern may be extensively or completely destroyed. After successful treatment this bone is replaced by a sclerotic type of bone, more dense and radiopaque than normal bone. The picture then is one which allows the roentgenologist to gage somewhat the response to treatment.

Disease of the Gonads • Hypogonadism appears to retard maturation of some parts of the skeleton with a resulting overgrowth of the bones. The teeth themselves undergo natural and normal development though it is said they tend to erupt prematurely. The opposite, a condition of hypergonadism, promotes maturation of the skeleton and also early development and eruption of the teeth.

Diseases of the Pancreas • The pancreas secretes two different materials; one, insulin, is endocrine in nature and is derived from the islands of Langerhans and the other is the pancreatic juice which is emptied directly into the intestinal tract. Insulin acts to maintain a normal level of blood sugar. When diabetes or hypoinsulinism occurs early in life, it is important to have a complete roentgenographic survey. Although periodontosis is not common in children, when it occurs to a noticeable degree the possibility of diabetes should be entertained.

Avitaminosis • Physiologic changes produced in dentition by deficiency of vitamins A, B and C are not visible in roentgenograms. However, vitamin D takes a prominent part in the metabolism of calcium and phosphorus and, hence, in the ossification of bone. The main diseases which occur as the result of a deficiency of vitamin D are rickets in children and osteomalacia in adults. In rickets the bone remains soft, bends and becomes easily deformed; it is caused by failure of the osteoid tissue to undergo calcification. It is said that rickets occurs far more frequently than anyone actually realizes. When rickets is severe, the jaws usually are underdeveloped and there is retarded shedding of the deciduous teeth and consequent retardation of the eruption of the permanent teeth. When rickets occurs after 6 years of age, the dental disturbance is less severe. Renal rickets is a disturbance in the calcium-phosphorus balance secondary to chronic nephritis. Skeletal deformity may develop and development of the teeth and jaws may be disturbed. Whenever this disturbance exists, the jaws are osteoporotic, possibly underdeveloped and the eruption of the permanent teeth is retarded. In osteomalacia decalcification of the bone

occurs; the softened bones become deformed, particularly those that are subjected to continual stress. Roentgenographically there is considerable reduction in the radiopacity of the bone and loss of the bony trabeculation.

When systemic disease exists, it is difficult to determine from intraoral roentgenograms the duration of the disease or the severity of the disease because of the possible response to therapy, the duration of the therapy and the resistance to therapy.

DEVELOPMENTAL DISTURBANCES OF THE SKELETON

Developmental disturbances of the skeleton probably result from hereditary factors. In some instances symptoms may be present at birth and in others they may develop during childhood or adolescence.

Osteopetrosis • One of the developmental diseases is Albers-Schönberg disease. This is also called osteopetrosis or marble bone. The osteosclerosis is caused by reduced osteoclastic activity and though the disease is probably present from birth it may develop later. Bone marrow tends to be eliminated because of the reduced osteoclastic activity. The bone is of poor quality and is extremely fragile; fractures are common. Osteomyelitis would be a prime consideration when patients with this condition undergo surgical procedures.

Achondroplasia • Achondroplasia is a disease, hereditary in nature, which consists of a disturbance of formation and development of the cartilage, producing a dwarf whose extremities are particularly short in ratio to the length of the torso. A retruded upper jaw and prognathous lower jaw are frequent characteristics. Teeth develop normally, although the eruption schedule may be retarded.

Cleidocranial Dysostosis • Cleidocranial dysostosis is a hereditary disease characterized by complete or incomplete aplasia of the clavical, delayed ossification of the fontanels and delayed eruption of teeth. Occasionally many of the teeth fail to erupt. Supernumerary teeth also are frequently found and occasionally follicular cysts exist in the jaws. The tendency of the maxilla to underdevelop makes prognathism noticeable. Abnormalities of the teeth and jaws are common. Orthodontists frequently are to be credited with the early discovery of the disease because the parents of children with cleidocranial dysostosis seek orthodontic treatment for the disturbed dentition of the child. The deciduous teeth may be retained which delays the eruption of the permanent teeth. The character of the bone may also be responsible for delayed eruption of the permanent teeth. Resorption of deciduous roots and also of the bone over the permanent teeth fails to occur. This presents a difficult problem from the standpoint of dental management because when the disease is first discovered the child may be very young and removal of all of the teeth would practically destroy the structure of the entire jaw. When the disease is discovered later in life, it is possible to remove the teeth as they start to erupt, or cause trouble, and readapt dentures to the jaws to accommodate these various erupting teeth.

Schüller-Christian's Disease • Schüller-Christian's disease is a disturbance of the reticulo-endothelial system which occurs most frequently in early life. The possible triad of symptoms and signs are defects of the bone, diabetes insipidus and exophthalmos. The bony defects are caused by accumulations of connective tissue containing foam cells filled with fat. The whole group of diseases of lipoid metabolism is rare and of unknown etiology. The pads of granulomatous tissue usually form in the periapical regions of the teeth. As these lesions expand, the sockets tend to be destroyed, with the developing teeth, both deciduous and permanent,

being forced from their original positions and exfoliated. The bone around the apexes of the teeth is so destroyed that the teeth have an appearance of actually floating within the jaws. Favorable response seems to follow general roentgen therapy. The disease usually occurs in children, but it may occur later in life when teeth are not present. The lesion may resemble a follicular cyst in many respects except that a tooth is not present and the lesion does not appear to be as well defined and is not surrounded by a denser area of bone.

Multiple Myelomas • Myelomas are formed from bone marrow cells. Multiple tumors which destroy the bone may be distributed rather widely throughout the body. They are found particularly in the spinal column, clavicles, sternum and skull. In the early stages roentgenologic changes are confined to lesions of the bone marrow. These tend to coalesce and form larger lesions. In the jaws multiple myelomas seem to occur first in the horizontal portion of the ramus, inferior to the inferior dental canal and near the angle of the mandible. As the disease progresses and the lesions coalesce, they may extend anteriorly. When no teeth are present, it is not uncommon to see the lesions approach the crest of the alveolar process. Multiple myelomas may be confused in the roentgenograms with giant cell tumor and with myeloblastoma. Intraoral roentgenograms alone are not diagnostic of multiple myelomas.

Osteitis Deformans or Paget's Disease • This is a skeletal disease which usually occurs relatively late in life. It is essentially resorption of bone which is followed by apposition of bone with the cortex and spongiosa being affected. Hypercementosis of tooth roots is frequent and many times is a point of extreme importance in the differential diagnosis. The bone tends to appear mottled, a radiolucency occurs with the resorptive phase of the disease and areas of increased density appear as apposition of bone occurs. Therefore, both resorptive and sclerotic lesions may be present in a single area. Paget's disease seems to be present more frequently in the maxilla than in the mandible and often is found in both jaws. The etiology of the disease is unknown. Surgical treatment may consist occasionally of the removal of excess bone of the jaws. It is usually advisable to wait until the active phase has subsided and the lesion tends to be dense and sclerotic.

Ectodermal Dysplasia • Ectodermal dysplasia is a disease of hereditary nature which is characterized by scantiness or absence of sweat glands, a total or partial absence of hair and partial or total anodontia. Faulty fingernails also are to be found. The degree of involvement of the disease depends on the time of onset. In total anodontia, the maxilla and mandible tend to be underdeveloped because of lack of stimulation for the formation of alveolar bone, which grows by apposition with eruption of the teeth. In partial anodontia the same picture pertains to a modified degree with some alveolar processes being present in the regions of the teeth but for the most part these processes are rather atrophic in character.

Nontropical Sprue • Nontropical sprue is a disease characterized by steatorrhea. In this disease the calcium is not absorbed from the intestinal tract, and demineralization of the bones results. The diagnosis cannot be made from the dental roentgenograms alone, although considerable radiolucency of the jaws might suggest disturbed metabolism of calcium. This is another opportunity to work with the internist in order to establish a diagnosis.

Postmenopausal Osteoporosis • Postmenopausal osteoporosis occurs in later life and is said to be caused by both

senile and disuse atrophy. There is nothing characteristic of the disease in the jaws except generalized demineralization. Evidence of such demineralization in itself, however, is not diagnostic.

Other Conditions • In addition to the diseases which have been considered rather briefly but specifically, there are lesions of osteoporosis and bone necrosis which occur in arsenic and lead poisoning and which may occur when radium or roentgen therapy has been used. Roentgenologic evidence of lesions produced by syphilis, tuberculosis and other granulomatous diseases are found in bones.

COMMENT

The opportunities for dentists to render valuable service in the field of general diagnosis are numerous. As an increasing number of hospitals establish dental departments, the opportunities for dental personnel to observe some of the changes which occur in general systemic diseases will increase. This implies and demands a thorough knowledge of the dental and osseous manifestations of systemic diseases, for only then is it possible to observe and to interpret correctly the roentgenographic changes which may occur.

Another approach to differential diagnosis is consideration of altered eruption of the teeth and of the possible etiologic factors which cause this deviation. In this it is well to think of the entire dentition and not just of a single tooth or of a few teeth. It is likewise important to record family history so that familial trends can be known. The early eruption of deciduous teeth may suggest certain glandular disturbances such as hyperthyroidism, hypogonadism or hypergonadism. Any alteration of eruption time or developmental status of the tooth when considered chronologically should also be considered. Retarded eruption of deciduous teeth suggests cretinism due to hypothyroidism. In cleidocranial dysostosis, however, retarded eruption and delayed exfoliation of the deciduous teeth also occur. In conditions causing early eruption of the permanent teeth, diseases which cause early eruption of the deciduous teeth must be considered. It is not usual for this to occur at an extremely early age. However, cases of hypergonadism, in which sexual precocity has been present[4]—usually caused by adrenal tumors—have been recorded, in which permanent teeth have erupted at an early age. Eruption of permanent teeth is accelerated to a certain extent when the deciduous teeth are removed prematurely. Retarded eruption has been reported in cases of hypopituitarism and in cleidocranial dysostosis; the failure of permanent teeth to erupt may be one classical symptom of the latter disease. Cretinism, due to hypothyroidism, can account for delayed eruption of teeth; rickets is said to cause delayed eruption.

Anomalies in the number, size and form of teeth may be suggestive of systemic diseases. Either the number of teeth may be reduced or the teeth may be entirely absent in ectodermal dysplasia. This condition occurs more frequently in males. When total anodontia of both dentitions occurs there is aplasia of the lamina dura. When additional teeth are present, one of the first things to be considered is cleidocranial dysostosis. I examined a patient who had more than 60 teeth within the structures of the jaw and only one or two crowns were visible through the gum tissue.

The variation in the size of teeth could probably be attributed to racial background. There are differences which occur in the same race and differences which occur between races, depending on whether the whole dentition or individual teeth are in question. Pituitary dysfunction, provided it is present before

4. Stones, H. H. Oral and dental diseases. Baltimore, Williams & Wilkins, 1948, p. 95-112.

development of teeth, could influence the size of the teeth as well as the skeletal structure. Usually it is the root portion of the tooth which is altered and not the coronal part. Oddly enough, in hyperpituitarism, which results in skeletal giantism, there is no change in the size of the teeth. Any anomalies which alter the form of teeth probably are entirely local even though some can be attributed to a background of certain systemic diseases, such as Hutchinson's teeth.

Alteration in structure of teeth may be caused by trauma during the time of development. This condition has been described as Hunter's teeth. There are changes which may occur because of metabolic disturbances such as spontaneous or idiopathic hypoparathyroidism. Hypoplasia in deciduous teeth, because of metabolic disturbances such as spontaneous or idiopathic hypoparathyroidism, is rare because the mother usually takes care of the developing fetus. The developing individual while in the uterus has hypoparathyroidism because the mother has compensatory hyperparathyroidism. At birth, therefore, there is an interval before the parathyroid gland of the child begins to function. This interval is recorded in the developing dentition and has been referred to as the neonatal line. When hypoplasia of permanent dentition occurs, several general causes such as cleidocranial dysostosis and the vitamin D, calcium, phosphorus deficiency group of diseases must be considered.

The question of elevated temperatures causing hypoplasia must be considered also. It may be the disturbed metabolism, which results when fever is present, rather than the fever itself which causes hypoplasia.

A new field of diagnostic dental roentgenography is developing as the result of the work by Brodie[5] and others in which the cephalometric technic will provide suitable data for study.

SUMMARY

For rational oral surgical treatment, adequate oral roentgenologic examinations are necessary. No surgical treatment is completed until the result has been evaluated roentgenographically. Most oral surgeons use both preoperative and postoperative oral roentgenograms. Such roentgenograms allow more than a means of discovering or orienting dental and oral pathology. They often prove a valuable aid in the recognition and diagnosis of developmental and endocrine disturbances.

5. Brodie, A. G. Eighteen years of research at Illinois. Angle Orthodont. 18:3 (Jan.-April); 63 (July-Oct.) 1948.

Revolution in Surgical Antisepsis • No greater revolution in surgical treatment has occurred during the past 10 years than in connection with sepsis. This has resulted largely from the introduction of chemotherapy and biotherapy, for the introduction of sulphonamides, penicillin, streptomycin and other substances which profoundly affect biochemical reactions, both of the leucocytes towards bacteria and of the bacteria themselves, has modified the surgical treatment necessary in the management of these previously dreaded conditions of sepsis. *Philip H. Mitchiner, "The Surgery of Sepsis," J. Internat. Coll. Surgeons, 12:405, July-August 1949.*

Oral manifestations of metabolic disturbances

Merrill J. Shepro, D.D.S., Berwyn, Ill.

The realization of the importance of changes occurring in the oral cavity during systemic disturbances creates one of the fundamental bonds between the dentist and the physician. The oral tissues, however, demand the most careful study and the closest scrutiny in diagnosis in order to reveal the delicate nuances of their reactions. Just as the dentist sometimes is too occupied in the treatment of the teeth themselves and overlooks the oral soft tissues, so, too, does the physician frequently look through the mouth instead of at the mouth in his examination of the pharynx. The mucous membranes and adjacent tissues of the oral cavity can give a wealth of information to the diagnostician who is familiar with their structure and their physiologic reactions.

The cavum oris is the only internal cavity that can be readily and routinely examined without the use of special instruments or technics, and as such, is of the utmost importance in medical and oral diagnosis. It is lined with a typical mucosa, it is dark and warm, and it presents a permanent moist environment. Its structures contain a wide variety of tissues of both ectodermal and mesodermal origin that can be observed side by side. These tissues range from the simple stratified squamous epithelial covering of the floor of the mouth to the complicated papillae of the tongue and the highly specialized matrixes of the enamel and dentin of the teeth (Fig. 1). Metabolic disturbances can result in changes that can be observed as variations in the mucous membranes, the teeth, the periodontal soft tissues, the alveolar and corporal parts of the mandible and maxillae and the saliva. In order to recognize abnormalities, however, a detailed knowledge of the normal structure and appearance is necessary.

DIAGNOSTIC CRITERIA IN THE ORAL TISSUES

The Mucous Membranes • The oral mucous membranes have a highly vascular connective tissue base containing various amounts of elastic fibers, depending upon their location and the function of the particular tissue. The oral tissues may be classified according to their function into three groups: the masticatory mucosa, the lining mucosa and specialized mucosa (Fig. 1). The mucosa covering the hard palate and the alveolar processes of the jaws is firmly bound to the periosteum of the underlying bone with heavy connective tissue fibers in the submucous layer. This is necessary for rigidity and immobility in order to resist the stresses of mastication. The mucosa of the floor of the mouth, cheeks and soft palate,

Formerly instructor in histology and embryology, University of Illinois College of Dentistry, Chicago.

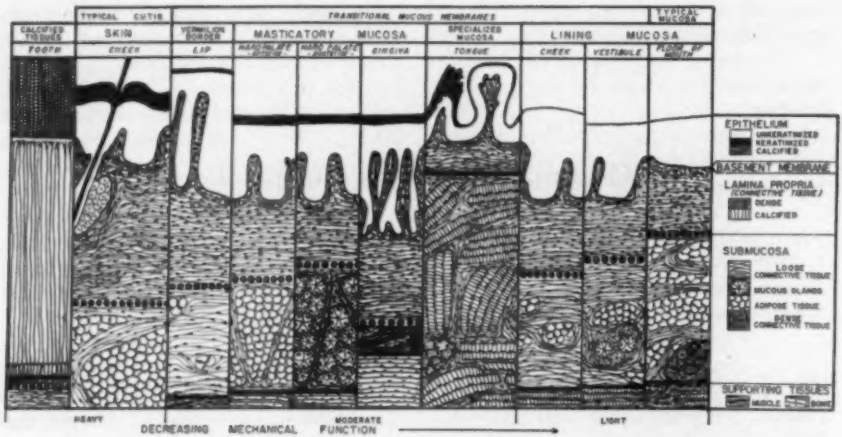

Fig. 1 • Diagrammatic representation of the variation in the thickness and character of the mucosa and submucosa in representative areas of the oral cavity, according to function.

however, is loosely attached and is freely movable in relation to the supporting structures. This is the lining mucosa. The specialized mucosa of the dorsum of the tongue is immovable over the muscular base and a submucosa is definitely lacking.

Overlying the connective tissue is a covering of stratified squamous epithelium. It also varies in structure according to functional demands (Fig. 1). The superficial layers may be unkeratinized or keratinized to various degrees. Because of the thinness and transparency of the epithelial covering of the oral membranes, the blood vessels of the underlying connective tissue can easily be seen and these give the color to the mucosa, from pale pink to red, depending on the character of the epithelium and connective tissue. Changes in the vascular status of the tissue, or changes in the density, thickness or degree of keratinization of the epithelium, will manifest themselves as changes in the normal color of the tissues. The color changes may range from white to deep bluish red.

The most delicate of the oral mucous membranes covers the floor of the mouth and the ventral surface of the tongue. The epithelium in this area is thinnest and unkeratinized making it transparent and allowing the fine blood vessels of the connective tissue to be seen. The epithelium of the mucobuccal fold and the inner surface of the lip is slightly thicker and has low rete pegs extending into the connective tissue. This tissue is less transparent and its surface has a characteristic granular appearance. The buccal lining mucosa is even thicker and its rete pegs extend slightly farther into the lamina propria, making it more opaque, especially in the area corresponding to the occlusal planes of the teeth.

In the epithelium of the masticatory mucosa, the gums, gingiva, and hard palate, the peculiar translucency of the tissue is gone. There is a keratinized layer varying in thickness according to functional demands and the rete pegs extend deep into the connective tissue. The surface has a stippled texture and the tissue is light pink and opaque.

The vermilion border of the lips has the thickest epithelium, blending into the epidermis of the skin. It is, however, more transparent than the masticatory mucosa because it has a thinner keratinized layer. Because the vermilion border is the final transition stage between typical mucosa and typical skin, it lacks the special features of each. It has neither the mucous glands of the mucosa, nor the sebaceous glands of the skin, and although it is subject to the same external environment as the adjacent skin, it has a much thinner hornified protective layer because of its histologic similarity to its adjacent mucous membranes. For these reasons it is dry and relatively unprotected and is an area of potential weakness. Clinical experience has shown that the lines of transition between skin and mucous membrane, and between various special types of mucous membranes are particularly susceptible to pathologic processes, as in the borders of the lips, the fornix of the vestibule and the lateral borders of the tongue.

The dorsum of the tongue is covered with highly specialized epithelial papillae. Some are covered with a heavily cornified epithelium that is rough and helps in the comminution of food (filiform papillae). Others contain special sensory organs for taste sensation (fungiform and circumvallate) and are covered with a smooth thin epithelium.

Since the oral tissues are in a perpetual state of irritation from mechanical, chemical and bacterial agents, they are being constantly traumatized and can maintain themselves only by rapid repair and replacement. The oral mucous membranes exhibit a very high reparative potential, but because of the delicacy of the process, and the continuous and rapid activity deep in the tissue, very slight variations in systemic or local metabolic conditions may produce profound effects on the superficial structures. Metabolic disturbances manifest themselves in changes in the appearance, structure and physiology of the tissue, and vary the color, texture, thickness, translucency and tonus of the tissues. Individuals with higher basal metabolic rates, for example, will generally show oral mucosa that is normally redder than those with lower rates. The oral mucosa is, therefore, a barometer of the general physical condition of the individual.

The Dental Tissues • The enamel is formed within the confines of its bony crypt by highly differentiated epithelial cells, the ameloblasts. The processes involved in the deposition and calcification of the enamel matrix are biochemically so complex and delicate that they are profoundly affected by even the slightest variation in metabolic activity of the organism. Changes in mineral metabolism, endocrine balance, local chemical status of the tissues, or quality of blood supply during tooth formation, may result in permanent stigmata in the form of hypoplastic, abnormally calcified or discolored enamel. These malformations will remain throughout the existence of the tooth because the enamel is not capable of repair. Since vital functions such as repair are confined to living cells, and since the enamel itself, when mature, does not contain living cells, nor is it in contact with living cells, repair or replacement of the substance of its matrix is not possible.

Disturbances in the dentin are not readily observed clinically since under normal conditions the dentin is not exposed to view in the oral environment. Roentgenograms will, however, show gross changes in shape, density, or calcification of the dentin. Metabolic changes can be seen in histologic sections as defects in the formation or calcification of the tissue (Fig. 2).

The cementum, also, is not normally exposed to view in the mouth although extensive cementum hyperplasia can be seen in the roentgenogram.

The hard tissues of the teeth are not

affected internally by changes in mineral metabolism after the teeth have been completely formed and have erupted into the oral cavity. Unlike bone tissue, which is physiologically active in mineral metabolism by constant resorption and apposition of its calcified matrix, the dental tissues of the permanent dentition are resorbed only under pathologic conditions. In the case of dentin and cementum, new layers of tissue can, under certain conditions, be deposited, but the enamel completely loses its formative organ before eruption and further deposition of enamel matrix is impossible.

The dental pulp cannot be examined clinically but its reaction to thermal and electrical stimuli can be studied and its size and position within the tooth can be determined from the roentgenogram.

The Periodontal Tissues • Among the periodontal tissues are the periodontal membrane and the alveolar bone. Under normal conditions, these tissues are not visible upon clinical examination of the mouth and observation of changes must be confined to roentgenographic examination. Among the important factors in these tissues are width of periodontal membrane, integrity of lamina dura, height of alveolar crests and density and structure of the alveolar bone.

The Saliva • The enamel of the teeth and the mucous membranes of the mouth are constantly bathed in a fluid environment, the saliva. Because of the permanency of this relationship, the outer layers of these tissues can be affected by changes in the character of the salivary secretion. Obvious changes are those which manifest themselves by their influences directly or indirectly upon the oral tissues. Biochemical analysis of the saliva reveals those that are more obscure.

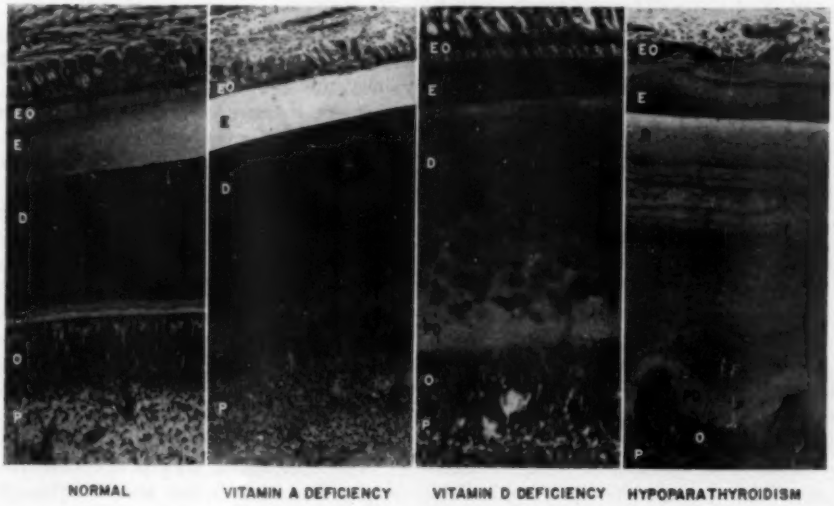

Fig. 2 • Photomicrographs showing effects of various deficiency states on the tissues of the rat incisor in experimental studies. EO, enamel organ; E, enamel; D, dentin; PD, predentin; O, odontoblasts; P, pulp

The saliva is formed in the mucous and serous alveoli deep in the submucosa of the oral tissues and is conveyed to the surface by means of duct systems. It is composed of secretory products in the form of enzymes and bacteriostatic substances, and of excretory products such as urea, cholesterol and inorganic salts which maintain the pH of the oral fluids by their buffer action.

Metabolic changes which decrease the pH of the saliva will manifest themselves by decalcification of the exposed dental tissues. If the alkalinity is increased, the result will be excessive formation of salivary calculus on the teeth. Increase in viscosity or decrease in bacteriostatic ability will cause a rise in caries activity and may permit bacterial invasion of the oral mucosa. Xerostomia results in the loss of the detergent action of the fluid saliva and accumulation of debris in the mouth, fetor ex ore, and the characteristic coated tongue. This decrease in salivary secretion may be one of the first signs of general body dehydration. Variation of the ammonia nitrogen content of the saliva has been shown to be inversely proportional to the incidence of dental caries.[1]

METABOLIC DISORDERS CAUSING ORAL CHANGES

By careful observation, analysis and evaluation of these oral symptoms, based on a thorough understanding of the basic anatomic and physiologic principles, the stomatologist is able to obtain much valuable information concerning body conditions in metabolic disorders; and is also able, in fact, to arrive at diagnoses of subclinical metabolic disorders that may otherwise have escaped unnoticed.

Changes in the oral cavity and oral syndromes in metabolic disorders can be considered according to the specific phase of metabolic activity that is distinguished as the main etiologic factor. Full recognition must be given, however, to the fact that no single metabolic process is independent of the others and that a disorder in any one will also bring about changes in the others.

Water Metabolism • Generalized systemic dehydration can be detected in subclinical states by the condition of the oral mucosa. The buccal mucosa becomes dry and loses its sheen and translucency. There is a decrease in salivary secretion and the tongue shows a dry white coating caused by decrease in the detergent action of the saliva and increase of the thickness of the cornified layers of the filiform papillae due to lowered rate of exfoliation of superficial cells.

Diabetes insipidus is characterized by excessive thirst and excretion of huge amounts of dilute, but otherwise essentially normal, urine. Oral symptoms are those of dehydration of the oral tissues and dryness of the mouth. Certain vitamin deficiencies also result in dehydration of the oral tissues.

Mineral Metabolism • Mineral metabolism is of importance to the tissues of the teeth only during the period of formation and calcification although the alveolar bone may be affected throughout the life of the individual. The completed enamel and dentin are not affected by calciprivic states or deficiency of any other minerals.[2,3] The teeth do not serve as a mineral reserve and do not participate in mineral metabolism as do the bones of the skeleton. Calcium deficiency that occurs after the teeth have erupted is not related to the incidence of dental caries.

1. Kesel, R. G., and others. Biological production and therapeutic use of ammonia in the oral cavity in relation to dental caries prevention. J.A.D.A. 33:695 (June) 1946.

2. Schour, I. Calcium metabolism and teeth. J.A.M.A. 110:870 (March 19) 1938.

3. Weinmann, J. P., and Schour, I. Experimental studies in calcification. I. The effect of a rachitogenic diet on the dental tissues of the white rat. Am. J. Path. 21:821 (Sept.) 1945.

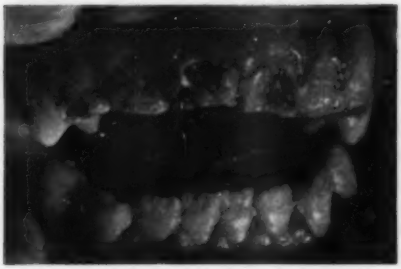

Fig. 3 • Severe enamel hypoplasia in a patient with a history of parathyroprivic tetany of infancy

Calcium or phosphorus deficiency or disturbance of the calcium-phosphorus ratio during the period of tooth formation will be manifest as permanent defects in the calcification of the hard tissues, and will remain throughout the life of the tooth. Hypocalcification of the enamel is evident as dark brown stains that occur only after eruption of the tooth and subsequent exposure of the enamel to oral fluids. Hypoplastic enamel (Fig. 3) indicates a disturbance in the formation of the tissue. It is not usually associated with hypocalcification except in very extreme cases.[4] The density of enamel calcification can be judged clinically by its translucency and color. White opaque areas indicate hypocalcification.

Dental fluorosis (mottled enamel) is a defect of the calcification of the enamel that occurs sometimes when the drinking water supply contains more than one ppm of fluorine, if this water is consumed by the individual during the period of enamel calcification. The higher the fluorine content of the water, the higher the incidence of mottled enamel among the population. The enamel in dental fluorosis is white and opaque and it later takes on a brown stain in spots that gives it its characteristic mottled appearance. This change is caused by a disturbance in the development of the enamel[5] and does not occur after the teeth have erupted. Ingestion of fluorine by the adult, therefore, does not result in mottled enamel. The presence of fluorine compounds in the enamel, however, makes it more resistant to dental caries and topical application of 2 per cent sodium fluoride to newly erupted teeth has been shown to be of value in reducing dental decay. It must be remembered, however, that this topical treatment of the enamel is a local change and not a metabolic change. The enamel of mature teeth is not affected internally by the administration of fluorine salts by mouth.

Iron deficiency is seen in the oral tissues in the form of hypochromic anemia. There is pallor of the mucous membranes and a reduction in salivary secretion with accompanying dryness of the mouth. The tongue may be smooth and atrophic. Anemic states can often be detected by oral examination long before any other symptoms appear.

Protein Metabolism • Hypoproteinemia causes dehydration of the body tissues. Oral changes in dehydration have been described earlier under disturbances of water metabolism.

In uremia, the urea content of the saliva rises parallel to the increase in the blood level. Salivary analysis can be used as a simple routine clinical procedure of observing the progress of uremia just as the blood level is employed. The oral tissues in uremia are inflamed and may be ulcerated. The gingiva is puffed and hemorrhages easily. The uvula is edematous and the tongue has a brown coating. There is xerostomia and fetor ex ore with a pronounced urinous odor. In severe uremia, the mucous membranes may

4. Sarnat, B. G., and Schour, I. Enamel hypoplasia in relation to systemic disease. J.A.D.A. 28:1989 (Dec.) 1941.

5. Schour, I., and Smith, M. C. Histologic changes in enamel and dentin of the rat incisor in acute and chronic experimental fluorosis. Univ. Arizona Agric. Exp. Stat. Tech. Bull. 52:69 (June 15) 1934.

be necrotic. The typical oral picture of uremic stomatitis can be seen in cases of kidney failure, gout or any other condition that results in either the excessive formation or faulty excretion of uric acid.

Lipoid Metabolism • Schüller-Christian's disease occurs chiefly in children and is accompanied by gingivitis, stomatitis, and loosening of the teeth due to fatty infiltration of the connective tissue and the alveolar bone. Roentgenographic examination shows clearly outlined radiolucent areas in the bones of the cranium and jaws (Fig. 4).

In Gaucher's disease, a rare condition also seen predominantly in children, the bones are seldom involved, but when they are, roentgenographic examination reveals mottled areas, evidence of resorption and defects of the bone similar to those seen in Schüller-Christian's disease. There is bleeding from the nose and gums. The bleeding and coagulation time of the blood, however, remains normal. Xanthomatous infiltration of the gingiva, leaving yellow patches on the tissue, has been reported in this disease[6] but these patches were not seen in cases examined by the writer.

Diffuse xanthomatosis does not show bone lesions. This condition is characterized by xanthomata in the skin and mucous membranes. Yellowish areas may appear on the oral mucosa, the pharynx and the epiglottis. There is lipoid infiltration of the periodontal tissues and there is bleeding from the gums in terminal cases. The typical case of diffuse xanthomatosis is also accompanied by diabetes insipidus.

Improper metabolism of fatty substances in the gastro-intestinal tract has been shown to cause severe halitosis by exhalation through the lungs of aromatic substances present in the blood.[7] A patient that has been on a prolonged milk diet, for example, will usually have a fetid breath.

Carbohydrate Metabolism • Oral symptoms in uncontrolled diabetes mellitus are characteristic. The breath has a fruity odor due to the high acetone content of the blood. The mouth and tongue are dry. Accompanying the increase in blood sugar is an increase in salivary alkalinity and huge deposits of salivary calculus may accumulate on the teeth (Fig. 5). Periodontitis associated with poor oral hygiene is also common. Roentgenographic examination may show generalized or local resorption of alveolar bone.

Acid-Base Balance • Acidosis caused by an excess of carbonic acid in the blood, either through excess formation or faulty buffer action, results in a lowering of the

6. Sutton, R. L., and Sutton, R. L., Jr. Diseases of the skin, ed. 10. St. Louis, C. V. Mosby Co., 1939.

7. Crohn, B. B. Halitosis in relation to oral diagnosis. Am. J. Orthodont. & Oral Surg. (Oral Surg. Sect.) 28:109 (Feb.) 1942.

Fig. 4 • Schüller-Christian's disease in male child, 4 years and 10 months old. Large radiolucent areas can be seen in the cranial bones and jaws indicating localized areas of xanthomatosis. Note absence of alveolar process. (Roentgenogram courtesy of Maury Massler, Chicago)

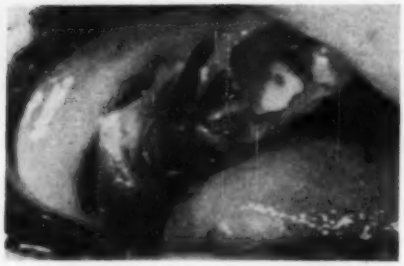

Fig. 5 • Salivary calculus deposits completely covering posterior teeth in diabetic woman, 60 years old

salivary pH. This increase in salivary acidity is revealed by decalcification of the exposed areas of the hard tissues of the teeth. The enamel takes on a brownish opaque color, becomes soft and granular, and may be lost through dissolution or mechanical erosion.

Increase in alkalinity of the oral environment is associated with an abundance of calculus deposits upon the teeth.

Endocrine Disturbances •

Thyroid • Thyroid deficiency in myxedema results in oral changes characterized by thickening of the lips and facial edema. In cretinism the face has a characteristic appearance (Fig. 6). The tongue is enlarged and may protrude from between the lips.

Hyperthyroidism during the period of enamel formation may result in a bluish white tooth color. Periodontosis has also been associated with this condition.

Parathyroid • Hyperparathyroidism influences the teeth through a rise in serum calcium. It can only affect the teeth, however, if it occurs during the period of tooth development at which time it causes hypocalcification. It can affect the alveolar bone, however, throughout life, and in this tissue it results in a change in the structural pattern of the bone. Osteitis fibrosa cystica, associated with an increased blood calcium level, may show large cystic areas in the jaws or cranial bones on roentgenographic examination. Adult teeth are not affected by osteitis fibrosa cystica since they are not subject to calcium withdrawal.

Hypoparathyroidism results in hypocalcemia and symptoms in the nervous system. In parathyroprivic tetany of infancy, the teeth may show enamel hypoplasia. This is caused by atrophy of the enamel organ before formation of enamel is completed (Fig. 2). The dentin shows disturbed calcification and irregular formation. Only the tissues that are calcifying at the time will be affected by this condition. There are, therefore, no evident oral effects of hypoparathyroidism when it occurs in the adult.

Pituitary • Disturbances in the function of the pituitary gland do not occur early

Fig. 6 • Cretin, showing extreme macroglossia. The tongue was enlarged so much as to seriously impede breathing and feeding. (Girl, 8½ months old.) (Photograph, courtesy of Dr. I. P. Bronstein, Chicago)

enough in life to influence the structure of the teeth. Hypopituitarism, however, results in retarded eruption of the dentition corresponding to retarded development of the entire body. Hyperpituitarism, on the other hand, causes supraeruption of the teeth due to overgrowth of the alveolar processes. The eruption rate of the teeth is accelerated. Since the cementum normally continues growth and formation throughout life, it is also affected and hypercementosis may occur.

Acromegaly also results in the characteristic disproportion between the mandible and maxillae caused by abnormal growth of the mandible at the condyles which results in malocclusion of the teeth. The lips become thick and the the tongue is enlarged and may have indentations at the sides made by the teeth.

Adrenal • An early sign of Addison's disease is the appearance of pigmentation of the oral mucosa, which can often be seen before other symptoms of the disease arise. Spots or streaks varying from pale brown to black are found on the gingiva (Fig. 7), the cheeks, the tongue and the vermilion border of the lips. Adrenal hypofunction also results in dehydration of the oral and body tissues.

Pancreas • Malfunction of the islets of Langerhans in the pancreas in diabetes mellitus results in oral symptoms of disturbance of carbohydrate metabolism as previously described.

Gonads • Oral changes in pregnancy are manifest as stomatitis gravidarum. The gingiva is hyperplastic, vascular and turgid (Fig. 8, above). It has a spongy appearance but is not painful unless irritated. Tumor masses may appear on the gums between the teeth during pregnancy and may become so large as to necessitate surgical removal (Fig. 8, below). Contrary to popular belief, there is no increase in caries activity due to pregnancy

Fig. 7 • Addison's disease, showing pigmentation of gingival mucosa. Brownish areas of pigmentation also appeared on the buccal mucosa

nor is there any withdrawal of calcium from the hard tissue of the teeth.

Stomatitis dysmenorrheica occurs periodically in patients with abnormal menstruation. It is characterized by inflammation of the gingiva, spontaneous bleeding and recurrent aphthosis.

The oral mucosa is very similar in structure and reaction to the vaginal mucosa and parallel changes can be observed during menstruation and during the period of the menopause. Climacteric patients exhibit oral symptoms consisting of atrophic changes in the mucous membranes that respond to hormone therapy[8] and hyperkeratosis of the buccal mucosa. This is also associated with dryness of the mouth and glossodynia.

Because the subject of endocrine influence on the oral structures is so complex, only a brief summary has been presented here. For more information on the subject, the reader is referred to literature dealing specifically with endocrines and dentistry.[9]

8. Richman, M. J., and Abarbanel, A. R. Effect of Estradiol and diethylstilbestrol upon atrophic human buccal mucosa with preliminary report on the use of estrogens in management of senile gingivitis. J. Clin. Endocrinol. 33:224 (April) 1943.

9. Schour, I., and Massler, M. Endocrines and dentistry. J.A.D.A. 30:595 (April) 1943; 763 (May) 1943; 943 (June) 1943.

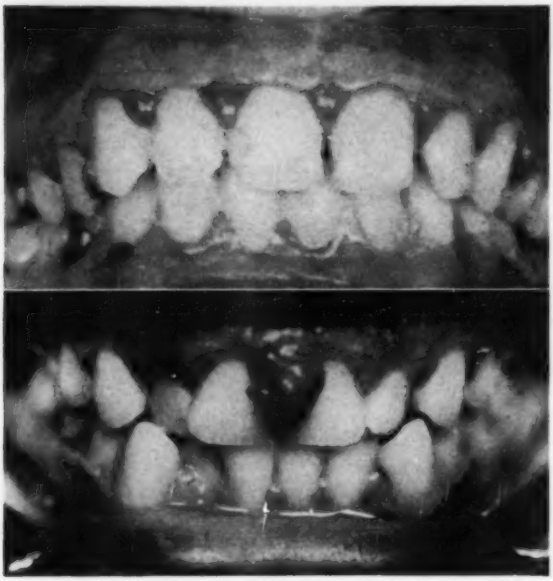

Fig. 8 • Stomatitis gravidarum. Above: Generalized hyperplastic gingivitis showing enlarged interdental papillae in the maxillary gingiva. Below: So-called "pregnancy tumor" showing neoplastic growth between maxillary central incisors

Dietary Deficiencies •

Vitamin A • Vitamin A deficiency especially affects the epithelial tissues. If the condition occurs in infancy, during the time of enamel formation, the enamel epithelium of the tooth germ will become degenerate and hypoplastic defects will remain in the enamel (Fig. 2). In the adult, hypovitaminosis A results in hyperkeratosis of the oral epithelium.

Vitamin B • Vitamin B deficiency also affects the oral mucosa and these tissues are especially sensitive to thiamine deficiency. Dehydration and small vesicles resembling herpetic lesions can be seen on the buccal mucosa, the ventral surface of the tongue or the palate.

Ariboflavinosis results in cheilosis, magenta glossitis and dermatitis in the nasolabial folds. This condition is also associated with capillary proliferation on the cornea of the eyes. The tongue lesion is peculiar to riboflavin deficiency. The filiform papillae become flattened and enlarged but do not desquamate, giving a purple-red color to the tongue. The tongue also often becomes edematous and it may show indentations along the sides made by the teeth. The lateral borders may also become denuded of epithelium and be very painful.

Niacin deficiency of pellagra shows a characteristic atrophic glossitis. The epithelial papillae of the tongue are desquamated, leaving it smooth, painful and fiery red. Niacin deficiency also results in gingivitis and stomatitis, often leading to ulceration of the interdental papillae of the gingiva. There is an increase in salivary secretion. The entire oral mucosa is scarlet red and fissures may be present at the angles of the mouth. The incidence of periodontal disease in pellagra is high.

Vitamin C • In contrast to vitamin A, vitamin C affects mainly the connective

tissues. In the oral cavity, these are the dentin, bone, periodontal membrane, cementum and the tissues responsible for the vascular supply. Vitamin C is necessary for proper wound healing and for maintenance of the periodontal tissue. Hypovitaminosis C is characterized by gingivitis with bleeding gums.[10] The teeth become loosened, the tongue may be enlarged and difficult to manage, and there is fetor ex ore. In advanced cases, the gingiva shows ulceration and necrosis and the salivary glands become enlarged and tender.

Barlow's disease in infants shows similar oral changes. The gums become swollen and purplish in color and bleed easily.

Vitamin D • Vitamin D plays an important part in the calcification of hard tissues of mesenchymal origin. The dentin, cementum and bone may show defective calcification in hypovitaminosis D (Fig. 2), but the enamel, being of ectodermal origin, is not affected. Experimental studies[3] in which a carefully controlled diet is maintained, deficient only in vitamin D, show that this deficiency alone does not affect either the formation or the calcification of the enamel. Enamel hypoplasia that is sometimes associated with clinical rickets is probably brought about by other coexisting nutritional insufficiencies.

The alveolar bone responds in rickets in much the same manner as do other bones of the body. Its poor calcification makes it unable to withstand the normal stresses and shifting of the teeth and malocclusion develop. The eruption of the teeth also may be retarded due to the effects of this deficiency state upon the supporting structures of the teeth.

Deficiency of vitamin D has no influence in the incidence of caries of the teeth.

Sprue • The clinical syndrome of sprue shows oral changes that are somewhat characteristic of this condition. The mucous membranes become ulcerated and there is an atrophic type of glossitis that results in raw painful patches on the surface of the tongue. The gums are pale in color and painful. There is profuse salivation, and, in advanced cases, severe aphthous stomatitis.

General Malnutrition • In cases of dietary deficiency, it must be borne in mind that no single specific hypovitaminosis occurs alone. If a patient has an inadequate diet, it may be deficient in several dietary essentials.

Contrary to popular belief, vitamin deficiencies that occur after the teeth have been formed have no effect on the incidence of dental caries. This has been recently demonstrated by Schour and Massler[11] in their studies of nutrition and the oral tissues of inhabitants of postwar Italy. Although almost every case showed severe malnutrition, the dental caries experience was considerably lower than that found in the United States. Gingival disease was very common, however, in these people.

Vitamin therapy has a definite place in oral medicine but it should only be used where a deficiency is known to exist. The empirical treatment of oral symptoms with vitamins "just in case" is not to be commended as in some instances it may be harmful to the patient.

The entire subject of the effects of vitamin deficiencies on the oral tissues cannot be covered entirely in this limited space. Further reference should be made to literature dealing specifically with the diet.[12]

10. Orban, B.; Martin, W. B., and Hehn, R. M. Histopathologic investigation of a case of scorbutic gingivitis. J. Periodont. 18:95 (July) 1947.

11. Schour, I., and Massler, M. Dental caries experience in postwar Italy (1945) I. Prevalence in various age groups. J.A.D.A. 35:1 (July 1) 1947.

12. Schour, I., and Massler, M. The effects of dietary deficiencies upon the oral structures. J.A.D.A. 32:714 (June) 1945; 871 (July) 1945; 1022 (Aug.) 1945; 1139 (Sept.) 1945.

Fig. 9 • Scleroderma. Left: Photograph of face showing parchment-like texture of skin, spotty areas of dermatitis and constriction of the mouth resulting in protrusion of the teeth. Below: Intraoral roentgenogram showing thickening of lamina dura and periodontal membrane

Metabolic Diseases of Uncertain Etiology •

Scleroderma • Generalized scleroderma is a disease of the integument that is characterized by fibrotic changes in the connective tissue. The skin becomes atrophic, hard, and mummy-like. It clings to the bones and underlying tissues like a parchment covering. The skin loses its pliability and wound healing and repair is greatly impaired.

Involvement of the oral tissues is usually a late symptom and occurs in cases where the skin of the head is affected. The oral mucosa undergoes generalized shrinkage. The lips become rigid and thin and the orifice of the mouth becomes constricted (Fig. 9, left). In advanced cases there is shifting of teeth due to pressure brought about by constriction of the oral soft tissues. Roentgenograms show bone changes characteristic of rapidly moving teeth. The lamina dura is heavier on one side, and the periodontal membrane is thickened (Fig. 9, below). When the tongue, soft palate, and uvula become involved there is serious impairment of deglutition and speech.

Acanthosis Nigricans • This is a rare disease involving chromaffin tissue insufficiency. It is characterized by pigmentation and papillation of the skin and mucous membranes. The cornified layers become hyperplastic and the papillae are enlarged. The buccal mucosa is thickened and may bear numerous papillomatous growths and the tongue may be fissured. In a few cases, general lymph node involvement has been reported.[6]

Porphyria • Vesicular cheilitis is associated with this metabolic disorder in which increased amounts of various porphyrins are found in the urine and feces. It has been reported[6] that in congenital porphyria teeth have a reddish color.

SUMMARY

The value of careful examination of the tissues of the oral cavity in diagnosis and the variety of their reactions in response to metabolic disturbances have been shown. It is these facts which demand close coordination of treatment by dentists and physicians. The dentist is in a position to diagnose many systemic disturbances by their oral manifestations long before the patient would ordinarily visit the physician, and the physician, recognizing oral symptoms in his examination, can refer the patient to the dentist or stomatologist for important treatment that would often be neglected.

The teeth and the oral tissues are an important part of the body organism and their condition is extremely vital to the health of the individual. Medical and dental diagnosis and treatment are both sadly deficient if they do not include a detailed examination and analysis of the oral mucous membranes. The realization has now come that the dentist and the physician must work in close cooperation in guarding the well-being of their patient.

6804 Windsor Avenue

Effect of hyaluronidase and Triton A-20 on conductive dental anesthesia

Bernard Tanz, D.D.S.; Alexander A. Jaworski,† M.D., and Leonard I. Elkins,‡ D.D.S., Staten Island, N. Y.*

The purpose of this study was to determine objectively the effect of hyaluronidase, a mucolytic enzyme, and Triton A-20,[1] a synthetic surface-active agent, on the facilitation of nerve block dental anesthesia. Using procaine hydrochloride as the control, and procaine with hyaluronidase or Triton A-20 as the experimental anesthetic solutions for mandibular nerve block anesthesia, the time from the injection to the point when extraction was possible without any pain was ascertained. The commercial hyaluronidase product used in this study was Wydase.[2]

Duran-Reynals[3] and McClean[4] were the first to note what they termed a "spreading factor," hyaluronidase, present in testicular extract which aided the spread of subcutaneously injected dye and fluid. Chain and Duthie[5] identified

*Resident, department of dentistry, Sea View Hospital, Staten Island, N. Y.

†Resident, pediatric department, Sea View Hospital.

‡Resident, department of dentistry, Sea View Hospital.

1. Supplied through the courtesy of Rohm & Haas Co., Philadelphia.

2. Supplied through the courtesy of Wyeth Institute of Biochemistry, Wyeth Incorporated, Philadelphia.

3. Duran-Reynals, F. Effect of extracts of certain organs from normal and immunized animals on infecting power of vaccine virus. J. Exper. Med. 50:327 (Sept.) 1929.

4. McClean, D. The influence of testicular extract on dermal permeability and the response to vaccine virus. J. Path. & Bact. 33:1045 (Oct.) 1930.

5. Chain, E., and Duthie, E. S. Identity of hyaluronidase as spreading factor. Brit. J. Exper. Path. 21:324 (Dec.) 1940.

the spreading factor as a mucolytic enzyme which acts on hyaluronic acid,[6] a mucopolysaccharide gel which is the intercellular cementing ground substance of mesenchymal connective tissue. By the depolymerization (hydrolysis) of the hyaluronic acid gel by hyaluronidase, the high viscosity of the hyaluronate gel is reduced, which, therefore, results in the facilitation of tissue permeability and fluid diffusion.

The utilization of the physiologic spreading factor properties of the enzyme for clinical application in subcutaneous fluid injection was first suggested by Sanella.[7] Recently, Jaworski and Farley[8] reported facilitation of hyaluronidase in fluid administration by hypodermoclysis in a group of 100 children.

The effect of hyaluronidase in increasing the diffusion area of local anesthetic agents in dentistry has been studied by Looby and Kirby,[9] who found that the addition of hyaluronidase to procaine-epinephrine added depth and facility to dental local anesthesia. In mandibular blocks, they found that anesthesias were more successful and more widespread and absolute than usual with the anesthetic solutions containing the enzyme, hyaluronidase. It was also shown that epinephrine counteracted the accelerated absorption of the hyaluronidase solution, but did not affect the increased area of anesthesia produced by the enzyme.

Triton A-20 (alkyl aryl polyether alcohol) is a relatively new organic liquid compound that excels as a surface tension and interfacial tension depressant, as well as a wetting and dispersing agent, a detergent and an emulsifier. These characteristics result from the peculiar molecular structure of surface-acting compounds, one portion of the molecule being hydrophilic, another portion, lipophilic. Because of its excellent ability to lower surface and interfacial tension, Triton A-20 is indicated to reduce the reaction time of any process which involves two or more heterogeneous phases, whether it is liquid-solid or liquid-liquid of incompatible aqueous and lipoid materials.

Therefore, it was decided to determine if the hydrophilic and lipophilic properties of Triton A-20 would produce a faster and better nerve block anesthesia by enhancing the aqueous procaine hydrochloride anesthetic solution in contacting and penetrating nerve tissue which is composed to a great extent of lipoid substances such as lecithin, cephalin and sphingomyelin. The Triton A-20 was added to the procaine solution in an attempt to decrease the block anesthesia interval; that is, the time from the injection of the anesthetic solution to the earliest possible painless extraction. Also, since Triton A-20 decreases the viscosity of the injected fluid by its ability to lower surface tension, a greater diffusion of the anesthetic solution results in the tissue, thereby tending to increase the frequency of successful block anesthesias.

Of the many available potent synthetic Tritons and other surface-active agents, Triton A-20 is best suited for pharmacological use, as it is nonionic, chemically stable at all temperatures and in many types of solutions, and most important, possesses extremely little tissue toxicity. Despite evidence as to the nontoxicity of this compound through extensive testing in mice,[10] its use in humans other than by the aerosol route[11, 12] of administration has not been previously recorded.

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10. Personal communications from Rohm & Haas Co., quoting data of Dr. R. J. Dubos.

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PRELIMINARY OBSERVATIONS

Prior to undertaking the nerve block anesthesia study, preliminary studies were made to insure the relative safety of Triton A-20 with hyaluronidase and procaine when administered by injection.

In 10 subjects, including 9 children hospitalized with primary tuberculosis and one of the authors (A.A.J.), intradermal and subcutaneous injections were performed on the inner aspect of the forearm, consisting of 0.2 cc. of Triton A-20 diluted in saline 1:1,000, 1:10,000 and 1:100,000. No untoward reactions were noted at the sites of the injections which were closely followed for 96 hours.

In 12 children, cutaneous procaine diffusion tests with and without Triton A-20 and hyaluronidase were performed to determine if these agents, when added to procaine, affected the area of spread of cutaneous anesthesia. Each subject received intradermal injections of four different anesthetic solutions which included, procaine-nordefrin, procaine-nordefrin-Triton-20, procaine-nordefrin-hyaluronidase, and procaine-nordefrin-Triton A-20-hyaluronidase. The concentrations of the four solutions were the same as were used in the mandibular block anesthesia study and are listed later in this article. The volume of each injection was 0.2 cc. The areas of cutaneous anesthesia were measured one hour after injection on the forearm and determined by noting absence of pain to pinprick which closely paralleled the blanching effect caused by the nordefrin.

Both Triton A-20 and hyaluronidase, when added to procaine-nordefrin, effected slight increases in the mean areas of cutaneous anesthesia as compared to the mean area caused by procaine-nordefrin alone. However, the increases of the area of cutaneous anesthesia with Triton A-20 hyaluronidase were slight and could not be interpreted as statistically significant. These results appeared to verify the work of Looby and Kirby[9] who noted that the tests for intradermal anesthesia did not show as great a spreading effect as subcutaneous anesthesia.

Lastly, pedal interdigital nerve block and mandibular nerve block anesthesias were tried on one of the authors, (A.A.J.), using anesthetic solutions consisting of procaine 2 per cent-nordefrin 1:10,000-Triton A-20, 1:10,000 with and without hyaluronidase 30 TR (turbidity reducing)[13] units per cc. Subjectively and objectively no untoward manifestations were observed during and following the injections of these anesthetic solutions.

METHOD OF STUDY

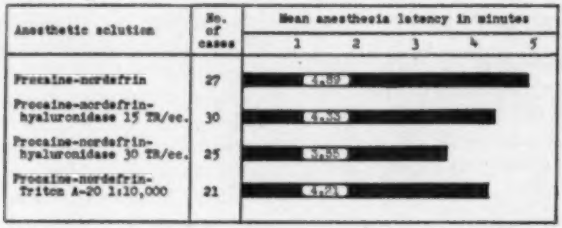
The study was carried out with 100 adult patients who were in need of dental extractions in Sea View Hospital, where tuberculosis is treated exclusively. It has been recently reported by Gruber,[14] that tuberculous patients do not differ from normal subjects in respect to their dental status, unless actual tuberculous lesions are present in the mouth. The study was restricted to adult patients who were free of oral tuberculous lesions and the age range was from 20 to 60 years. There was an equal division of male and female patients.

Patients selected for the study were limited to those who required mandibular extractions, namely the molar, bicuspid and cuspid teeth. Almost all patients were unilateral extraction cases. At no time were the patients aware that an experimental program was in progress and that they were receiving a new anesthetic.

The four anesthetic solutions with their respective constituents and concentrations used and tested throughout the study are as follows:

13. A TR unit is defined as the amount of hyaluronidase that reduces the turbidity caused by 0.2 mg. hyaluronic acid in horse serum to that caused by 0.1 mg.

14. Gruber, I. E. The condition of the teeth and the attachment apparatus in tuberculosis. J. D. Res. 28:483 (Oct.) 1949.



Mean block anesthesia latency in minutes with various anesthetic solutions in mandibular extractions

Procaine 2 per cent—nordefrin 1:10,000.

Procaine 2 per cent—nordefrin 1:10,000—hyaluronidase 15 TR units per cc.

Procaine 2 per cent—nordefrin 1:10,000—hyaluronidase 30 TR units per cc.

Procaine 2 per cent—nordefrin 1:10,000—Triton A-20 1:10,000.

The control anesthetic solution consisted of procaine hydrochloride 2 per cent with a vasoconstrictor, nordefrin hydrochloride 1:10,000. Two of the experimental solutions contained the procaine-nordefrin with the addition of 15 and 30 TR units of hyaluronidase per cc. respectively. The hyaluronidase was supplied as lyophilized Wydase, 150 TR units per vial. The other experimental solution contained Triton A-20 1:10,000 plus the procaine-nordefrin control anesthetic.

Solutions not used within 48 hours were discarded, thus insuring optimum potency of the hyaluronidase enzyme. The amount of the anesthetic solution used for each mandibular block injection was approximately 2.2 cc. All injections were administered with a 10 cc. syringe and 1½ inch number 21 gage needle.

All of the extractions were performed under mandibular block anesthesia by two of the authors (B.T. and L.I.E.) who had no knowledge of the type of anesthetic solution that they were injecting and evaluating, thus eliminating any possible biased personal tendencies.

The time from the injection of the anesthetic agent to the beginning of the earliest possible extracting procedure was carefully recorded as the period of anesthesia latency in minutes and seconds by the individual operator. It was assumed that an adequate depth of anesthesia was reached when removal of the tooth was possible without any pain to the patient. By probing the periodontal tissues with an explorer and a periosteal elevator, the operator was able to determine approximately when the time of adequate anesthesia was reached to permit the earliest extraction of the tooth.

RESULTS

The period of anesthesia latency in all mandibular extractions was carefully noted. This period is the least time elapsed between the injection of the anesthetic solution and the full depth of anesthesia as judged by the earliest painless extraction. The mean values of anesthesia latency with the four different anesthetic solutions are shown in graphic form in the illustration. In 27 mandibular extractions, the mean period of anesthesia latency of the control anesthetic solution of procaine-nordefrin was established as 4.89 minutes.

With the addition of hyaluronidase 15 TR units per cc. to the procaine-nordefrin control solution, the mean block

Table 1 • Limits of block anesthesia latency with various anesthetic solutions in mandibular extractions

Anesthetic solution	Limits of anesthesia latency in minutes	
	Shortest time	Longest time
Procaine-nordefrin	2.50	10.0
Procaine-nordefrin-hyaluronidase 15 TR/cc.	1.16	12.0
Procaine-nordefrin-hyaluronidase 30 TR/cc.	1.66	5.5
Procaine-nordefrin-Triton A-20 1:10,000	1.66	6.5

anesthesia latency period in 30 cases of mandibular extraction was reduced to 4.33 minutes, which represented an 11 per cent decrease as compared to the mean anesthesia latency period of the control procaine-nordefrin solution.

When the amount of hyaluronidase was increased to 30 TR units per cc. in the procaine-nordefrin solution, the mean latency period of anesthesia, on the basis of 25 mandibular extractions, was further decreased to 3.55 minutes. This value as compared to the mean anesthesia latency of the control procaine-nordefrin solution was equivalent to a 27 per cent reduction.

In 21 mandibular extractions, the anesthetic solution for the nerve block anesthesia consisted of Triton A-20 1:10,000, a surface-active agent, with procaine-nordefrin. The mean anesthesia latency with the Triton A-20-procaine-nordefrin solution was calculated to be 4.21 minutes. The anesthesia latency reduction effected by Triton A-20 in comparison to the mean value of the control procaine-nordefrin solution was 14 per cent.

The shortest and the longest time intervals for obtaining full block anesthesia for the extractions with the four anesthetic solutions which were tested are listed in Table 1.

In evaluating the efficacy of an anesthetic solution, the frequency of successful anesthesia is also an important consideration. The percentages of successful mandibular nerve block anesthesia with the four anesthetic solutions are shown in Table 2. With the addition of hyaluronidase or Triton A-20 to the procaine-nordefrin, the frequency percentage of successful block anesthesias was slightly better than the results obtained with the control procaine-nordefrin solution.

The effects of hyaluronidase and Triton A-20 were considered additive, since with a mixture of procaine-nordefrin, hyaluronidase 15 TR units per cc. and Triton A-20 1:10,000 used in 8 instances of nerve block anesthesia, the mean period of anesthesia latency for extraction was decreased to 3.75 minutes. This mean value was calculated to represent a 23 per cent decrease as compared to the mean anesthesia latency period of 4.89 minutes in extraction with the control procaine-nordefrin solution.

There were no local undesirable effects noted at the injection point area immediately or postoperatively. Also, no general side effects such as syncope, shock,

Table 2 • Frequency of successful block anesthesia with various anesthetic solutions in mandibular extractions

Anesthetic solution	No. of cases	No. of successful anesthesias	Frequency of successful anesthesias in per cent
Procaine-nordefrin	33	27	82
Procaine-nordefrin-hyaluronidase 15 TR/cc.	30	30	100
Procaine-nordefrin-hyaluronidase 30 TR/cc.	27	25	93
Procaine-nordefrin-Triton A-20 1:10,000	22	21	96

malaise or rash were observed at any time following the injections. The entire study was devoid of any untoward reactions noticeable to the observers and the patients.

COMMENT

Since the total number of cases tested was not great, the results of this study cannot be considered as conclusive. However, the results obtained, under unbiased conditions, from this preliminary investigation suggest that the addition of a spreading factor enzyme and a surface-active agent to the procaine-nordefrin solution facilitated nerve block anesthesia.

The reduced latency period of anesthesia which was obtained with hyaluronidase possibly can be attributed to the lowering of the viscosity of the intercellular cement substance which normally inhibits the diffusion of various fluids in the tissue, in this case the anesthetic procaine-nordefrin solution.

The reduced anesthesia latency period and the increased frequency of successful anesthesias obtained with Triton A-20 were possibly due to the ability of Triton A-20 to lower interfacial and surface tension, thus aiding the procaine-nordefrin solution to diffuse in the tissues and to contact the nerve fibers.

SUMMARY

One hundred and twelve mandibular extractions were performed to evaluate the effect of hyaluronidase, a mucolytic enzyme, and Triton A-20, a synthetic surface-active agent, in the facilitation of nerve block anesthesia.

With the addition of hyaluronidase 15 and 30 TR units per cc. to a procaine-nordefrin solution, the mean block anesthesia latency in mandibular extractions was reduced by 11 and 27 per cent respectively as compared to the mean anesthesia latency period of the control procaine-nordefrin solution.

Triton A-20 1:10,000 plus procaine-nordefrin effected a 14 per cent reduction of the mean anesthesia latency of mandibular extractions in comparison to the mean value of the control procaine-nordefrin solution.

The frequency of successful block anesthesia was slightly increased with the addition of hyaluronidase and Triton A-20 to the control procaine-nordefrin solution.

The results of this preliminary study suggest that hyaluronidase and possibly Triton A-20 aid in the facilitation of the routine procaine-nordefrin nerve block anesthesia in dentistry. Additional evidence is needed before the general use of these combinations can be recommended.

Great Men • Great men are like meteors, which shine and consume themselves to enlighten the earth. *Napoleon*

Prescription aids in everyday dentistry

Emanuel Bernstein, D.D.S., and Isaac Neuwirth, Ph.D.,
New York

It is an unfortunate fact that prescriptions are too infrequently written by the dentist. While the greater part of therapy in dentistry concerns itself with procedures in the mouth and the application of therapeutic agents directly by the dentist, it should be emphasized that the use of prescriptions serves as a valuable and necessary adjunct to the proper practice of dentistry. The practitioner who does not avail himself of this advantage fails to do justice to both the patient and himself. By prescribing drugs where indicated, the practitioner has complete control over the case in question. This procedure eliminates the dangerous practice of self-medication, so often indulged in by patients.

A prescription is the prescriber's (physician's, dentist's, veterinarian's) written formula for medicines, with directions to the pharmacist for compounding them and to the patient for taking them. This definition does not preclude the use of a single drug already prepared in its dosage form (tablets, capsules, and so forth).

An official prescription in this country is one that calls for a preparation listed in any one of the three official texts: *United States Pharmacopoeia* (U.S.P.), *National Formulary* (N.F.) and the *Homeopathic Pharmacopoeia*. The reason the preparations listed in these texts are called official is because the standards given for the preparations in them are recognized by the Federal Food, Drug and Cosmetic Act of 1938. It should be borne in mind that official drugs are available under trade names. Many drugs may be marketed by different manufacturers. In many instances, prescribing the drug under the official name will result in economy for the patient, a factor to be considered, and may serve as an added convenience to the pharmacist. There is no objection, however, to proprietary mixtures which serve a special purpose. In the latter instance it would be well to use the latest edition of *Accepted Dental Remedies* as a guide.

The prescriptions in this paper are written in English and the metric system. When the vertical line appears in a prescription it indicates that the prescription calls for quantities in the metric system: for weight in grams (Gm.) and for volume in cubic centimeters (cc.). This vertical line designates the decimal point. Prescriptions calling for the metric system of weights and measures use Arabic numerals.

Many advantages have been claimed for the use of Latin over English. The chief argument in favor of Latin lies in the patient being unaware of the medi-

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Department of pharmacology and therapeutics, New York University College of Dentistry.

cine prescribed. The exponents of prescriptions written in Latin contend that this will prevent self-medication and the use of habit-producing or addiction-producing drugs. This argument is nullified by the frequent similarity between Latin and English nomenclature, and the fact that the sale of dangerous drugs is regulated by law.

The Harrison Narcotic Act is designed to regulate the manufacture, sale and distribution of certain drugs regarded as dangerous. In this group are included drugs which are capable of producing addiction, such as opium, cocaine, and their derivatives, and marihuana. The sale of procaine is not regulated by this law.

In order to prescribe narcotics, the practitioner must be licensed each year by the U. S. Department of Internal Revenue. The registry number issued to him must appear on all prescriptions calling for drugs listed by the Harrison Narcotic Act. The Act specifies the form of the prescription in some detail. Such prescriptions should be signed in full, dated, and contain both the address of the prescriber, and the patient's full name, address and age. A record of each narcotic prescription must be kept by the prescriber. Prescriptions of this type cannot be refilled.

Some states require state registration as well as registration with the U. S. Department of Internal Revenue. There may be some variation of registration procedure from state to state.

While the writing of a prescription is traditionally regarded as a difficult task, the tradition is probably based on the prescription of many decades ago, which was written in Latin according to the apothecary system of weights and measures, and which listed many ingredients. Today, the prescription can be written easily because the symbols may be those of English and the metric system. In addition, the modern prescription generally contains few ingredients and the problem of incompatibility of ingredients is lessened to a great extent.

There are no better words to express what the prescription embodies than the following:

> . . . a prescription is infinitely more than can be simply defined. It is a summary of the physician's diagnosis, prognosis and treatment of the patient's illness. It brings to a focus on one slip of paper the diagnostic acumen and therapeutic proficiency of the physician. The prescription is truly the ultimate step in the application of pharmacology to clinical medicine, and combines the knowledge of the absorption, fate, excretion, action, toxicology and dosage of drugs with the requirements for restoration of the patient to health.[1]

RELIEF OF PAIN

Relief of pain is one of the most important functions any member of the healing professions is called upon to fulfill. From a practical standpoint, the first symptom which brings the average patient to the dental office is pain, whether it be faint and fleeting, or intense and incessant.

Pain may occur in dentistry from a variety of causes. In a high percentage of cases, operative or surgical procedure directly in the office will afford relief. In certain cases, however, the dentist may find it necessary to prescribe an agent to be taken at home for the relief of pain.

In the following pages, prescriptions which cope with varying degrees of pain are presented. The drugs available for the relief of pain vary in range from as common and mild an agent as aspirin to as potent a depressant as morphine. Combinations of drugs may also be employed.

Acetylsalicylic Acid • The following prescription embodies the characteristics of the complete prescription (patient's name, address, age, and so forth), and

1. Goodman, Louis, and Gilman, Alfred. The pharmacological basis of therapeutics. New York, Macmillan Co., 1941, p. 1305.

similar identification for the prescriber. For the sake of brevity this information is omitted in the prescriptions listed later in this paper.

JAMES DOE, D.D.S.
322 Hunt Street, New York 2, New York
Phone: Or 9-1880

Date: June 15, 1950
For: Mrs. John Smith, 821 Fifth St., N.Y.C.
Age: 33 years

℞

Acetylsalicylic Acid Tablets	0	30
Dispense twelve (12)		

Label: Take two (2) tablets every four hours when necessary for pain.

Federal Registry No. James Doe, D.D.S.

Acetylsalicylic acid (aspirin) U.S.P. is available also in capsule form.

This agent is useful only when dealing with the mild type of pain. Its action on pain is believed to be caused by its depressant effect in the region of the optic thalamus.

Since aspirin is an agent in common use, and some persons show an idiosyncrasy to it, the prescriber should question the patient for such a history.

The dose prescribed is twice the official dose (0.3 Gm.). This usually is well tolerated and found to be more adequate. Where pain is severe, this agent alone will not be effective.

In this group of drugs (antipyretic analgesics), a similar prescription serving the same purposes could be written for acetophenetidin (Phenacetin) tablets, dose 0.3 Gm.

The basis of many popular proprietary preparations for the relief of mild pain and headache is aspirin, acetophenetidin and caffeine. Whether this combination is superior to the use of either aspirin or acetophenetidin singly is open to question, although such claims have been made.

Another agent in this group of drugs is aminopyrine. Because of the occasional toxicity (agranulocytosis) reported with its use, this drug is not recommended.

Acetylsalicylic Acid and Pentobarbital Sodium • The following prescription, as contrasted to the one for acetylsalicylic acid alone, is useful for moderate pain, accompanied by apprehension, anxiety and nervousness.

℞

Acetylsalicylic Acid	0	60
Pentobarbital Sodium	0	03

Mix and place into a capsule
Dispense twelve (12)
Do not repeat

Label: Take one (1) capsule every four hours when necessary for pain.

James Doe, D.D.S.

In addition to the depressant action of the barbiturate on the central nervous system which allays the apprehension and nervousness, the barbiturate also potentiates the analgesic action of aspirin. For this purpose, only one-third the hypnotic dose (0.1 Gm.) is prescribed, as contrasted to the barbiturate prescription suggested for premedication.

Some authorities believe barbiturates used over a prolonged period can be habit forming. Since overdosage has led to serious accidents, the statement "Do not repeat" is appended to the subscription. This precaution is no longer necessary in many states, since the law prohibits the refilling of barbiturate prescriptions. In a few states, however, prescriptions for barbiturates can be refilled at the request of the patient, unless the practitioner expressly designates otherwise.

Codeine Phosphate Tablets • Codeine is prescribed in conditions involving severe pain. It acts to prevent the perception of pain in the higher centers of the central nervous system by depressing the pathways by which the response to pain is transmitted. It is believed that this depression occurs at the synapses in the region of the basal cerebral ganglia.

℞

Codeine Phosphate Tablets	0	03

Dispense six (6)

Label: Take one (1) tablet every four hours for severe pain only.

Federal Registry No. James Doe, D.D.S.

Dosage can be varied from 0.015 to 0.060 Gm. to meet the individual need of the patient.

The prescription of codeine is regulated by the Harrison Narcotic Act. Addiction to codeine is much less readily produced than addiction to morphine.

Codeine Phosphate and Acetylsalicylic Acid • The advantage of the following prescription over that for codeine alone lies in the additive effect produced by the aspirin.

℞

Codeine Phosphate	0	03
Acetylsalicylic Acid	0	30

Mix and place in a capsule

Dispense six (6)

Label: Take one (1) capsule every four hours for severe pain only.

Federal Registry No. James Doe, D.D.S.

Meperidine • Meperidine might be regarded as the agent of choice for the relief of the most severe type of pain encountered in dentistry.

℞

Meperidine Hydrochloride Tablets	0	050

Dispense six (6)

Label: Take one (1) tablet every four hours for severe pain only.

Federal Registry No. James Doe, D.D.S.

This drug is known also as Demerol, Dolantin, or isonipecaine. It is a synthetic substance, prepared as a result of the widespread search for morphine substitutes. The object of this search was to retain the pain relieving quality of morphine, but to minimize its undesirable side effects, the chief of which is addiction.

Addiction produced by the use of meperidine is not so readily developed, nor is it as vicious as that produced by morphine. The sale of meperidine is regulated by the Harrison Narcotic Act.

TREATMENT OF INFECTION

The advent of such powerful therapeutic agents as penicillin, aureomycin, and others, has resulted in a great decrease in the use of the sulfonamide group in both dentistry and medicine. They have almost replaced the sulfonamides except in certain specific infections. *Accepted Dental Remedies* for 1951 states, "since all of the sulfonamide compounds are capable of causing relatively severe toxic reactions when used internally, it is the opinion of the Council that their extensive oral administration in general dentistry is not advisable. When the need for such medication arises, it may, if practicable, be given in cooperation with the patient's physician." For this reason no prescriptions for the sulfonamide group are given.

Penicillin • Penicillin has the widest margin of safety of any therapeutic agent now in use. In nonsensitive individuals, there seems to be no limit to the amount of penicillin that can be used in the treatment of disease, without fear of toxicity. Although this agent is most active against gram-positive bacteria (*Staphylococcus aureus,* pneumococci, hemolytic streptococci), it also exerts an influence against certain gram-negative organisms.

The exact mechanism of action of penicillin is unknown. Since it seems to be most effective against young bacteria, it may affect bacterial metabolism during early developmental stages.

Aureomycin, one of the most versatile of the new antibotics, is beginning to have useful applications in dentistry. It is much more effective against gram-negative organisms, and seems to have a much wider bacterial spectrum of influence than penicillin.

Rocking of a tooth during extraction or scaling and curettage may produce a transient bacteremia. This is a dangerous occurrence in any patient who has a history of rheumatic fever or valvular disease of any kind. A healed valve lesion, with subsequent scar tissue formation, is a vulnerable spot for bacteria to lodge and set up vegetation. This leads to subacute bacterial endocarditis.

It is an inescapable fact that many patients with subacute bacterial endocarditis give a history of dental surgery a few days before the onset of illness. Many patients with healed lesions, which have followed attacks of rheumatic fever in early childhood, appear to all intents and purposes, in perfect health. They are no less vulnerable to the possibility of contracting endocarditis than the patient with obvious cardiac disease. In view of this situation, the importance of a careful and thorough case history cannot be over-emphasized.

Penicillin is used prophylactically to protect the patient against this possibility. A recognized procedure involves intramuscular injection of 300,000 units of procaine penicillin on the day prior to surgery, the day surgery is performed, and for two days following. The injection may be made in the upper outer quadrant of the buttock or in the deltoid muscle with a 20 gage 1½ inch needle. Since most dental offices do not have suitable arrangements for the administration of gluteal injections, the deltoid region has been preferred. Intramuscular injection is definitely the method of choice. However, if the parenteral route cannot be followed, the oral administration of penicillin can be used.

℞

Penicillin Tablets, 250,000 Units
Dispense twenty-four (24)
Label: One (1) tablet every three hours.
James Doe, D.D.S.

This prescription is intended for prophylactic use against bacteremia.

These tablets are available also in dosages of 50,000 and 100,000 units each. Penicillin can be given orally for systemic use; however, the oral dose of penicillin must be 4 or 5 times the parenteral dose to obtain absorption in appreciable quantities. Therefore, in order to be consistent, 1,500,000 units over a 24 hour period would have to be dispensed by the oral route.

Penicillin blood levels obtained by this method are variable and uncertain. In addition, this is a costly and wasteful method. Parenteral administration is recommended without reservation as the method of choice wherever possible. Penicillin for oral administration should not be prescribed for severe infections.

Penicillin is not the only agent which can provide protection against possible subacute bacterial endocarditis. Should an idiosyncrasy to penicillin exist, aureomycin, or the sulfonamide group, can be used.

Antihistaminic agents may be prescribed in controlling untoward reactions associated with penicillin therapy. These are discussed later in this paper.

℞

Penicillin Troches, 20,000 Units
Dispense twelve (12)
Label: Allow one (1) tablet to dissolve in mouth every three hours.
James Doe, D.D.S.

This prescription is for the local use of penicillin in the treatment of the acute phase of Vincent's stomatitis. This use has been found effective. Within a day or two after the onset of such treatment, the patient usually experiences relief from the acute symptoms. It is then possible to employ the operative procedures necessary for ultimate complete return to normalcy, such as scaling, curettage, and so forth.

In conjunction with the above local treatment, a 300,000 unit intramuscular injection of procaine penicillin may be given, as described earlier.

Aureomycin • The usual dosage of aureomycin is 25 mg. per kilo of body weight, every 24 hours. This would be about 2.0 Gm. of aureomycin for the average adult. Divided into four equal doses, 500 mg. would be dispensed every six hours.

℞

Aureomycin Hydrochloride Capsules 0 | 25
Dispense sixteen (16)
Label: Two (2) capsules every six hours with milk.

James Doe, D.D.S.

For severe infections such as acute alveolar abscess, or Vincent's stomatitis, aueromycin can be given systemically in this manner by the oral route. It can also be used prophylactically in this dosage against possible bacteremia during dental surgery, when an objection to the use of penicillin exists. A great advantage in its use lies in the fact that aureomycin can be administered by the oral route.

Aureomycin can be given intravenously, but oral administration is preferred because of its ease of absorption from the gastrointestinal tract. The use of milk as specified in the prescription for aureomycin is recommended to prevent possible irritation to the gastrointestinal tract because of the acidity of the preparation.

Aureomycin may produce certain undesirable side reactions:

1. Nausea, vomiting, or epigastric disorders. It should be used with caution by any patient who has a history of peptic ulcer, since perforation may occur.

2. Lesions of the skin and mucous membranes, which will disappear on cessation of the use of the drug. Administration of B vitamins will do much to diminish the occurrence of these lesions. A theory advanced postulates that a B vitamin deficiency is produced by inhibition by the aureomycin of bacterial synthesis of vitamins in the intestine. This is supported by the fact that the lesions resemble very closely those seen in patients suffering from a vitamin B deficiency.

HEMORRHAGE

The problem of hemorrhage control following dental surgery is one of paramount importance. From a practical standpoint, the most effective measures are those employed locally by the dentist in the office.

In the ordinary case, the best method involves the application of mechanical pressure to the area, thus giving the wound the opportunity to form a normal clot. Various astringents based on the principle of protein precipitation have been used. Agents which fall into this classification are alum, iron salts and tannic acid. These have been more or less discarded of late because of the frequent sloughing and necrosis which occur following their use. In addition, they produce ugly stains and discoloration in many cases. Another local method involves use of a vasoconstrictor to check hemorrhage. At best, this will produce only a transient effect, and is not effective in severe hemorrhage. Agents such as thromboplastin and thrombin which accelerate the clotting mechanism have produced good results locally.

In recent years, "absorbable hemostatics" such as absorbable gelatin sponge and oxidized cellulose have been introduced in oral surgery. The advantage of these agents lies in the fact that once inserted, they need not be removed. The tissues seem able to convert and absorb them. Gelatin sponge also can serve directly as a carrier for other agents (thrombin, penicillin); on the other hand, oxidized cellulose first must be rendered alkaline before it can be used as a carrier for thrombin.

The question arises: What can the dentist prescribe for the patient either preoperatively or postoperatively to control bleeding? Calcium salts have been recommended for systemic administration for

this purpose. The use of calcium in this connection is irrational. *Accepted Dental Remedies*, 1951, states, "Calcium is necessary for coagulation of the blood. This has led to its use in hemorrhagic conditions such as hemophilia, purpura, and the intestinal hemorrhage of typhoid fever. Administration of calcium compound in these conditions is probably ineffective. Administration of large doses of calcium gluconate and viosterol to normal adults does not decrease the coagulation time of the blood."

Other substances which have been studied in this connection include Ceanothyn, Styptysate, gelatine, Coagulen, Fibrogen and histidine. None were found to affect coagulation time in any significant manner.

Menadione • A drug which conceivably could assist blood coagulation by systemic administration is menadione. This is a synthetic compound with vitamin K activity. Following is a prescription for this agent with the appropriate indications and rationale for its use.

℞

Menadione Tablets, U.S.P.	0	002

Dispense fifteen (15)

Label: Take one (1) tablet daily.

James Doe, D.D.S.

This prescription is given when the dentist suspects hypoprothrombinemia.

Menadione is synthetic vitamin K, which is related to the formation of prothrombin, a vital factor in blood clotting. Studies have indicated that administration of menadione decreases clotting time, especially in patients where a hypoprothrombinemia already exists. Various factors may contribute to such a condition:

1. Poor nutrition with low vitamin K intake. This condition was prevalent during World War II in countries where food became scarce.

2. Poor absorption of vitamin K caused by the absence of bile salts. In patients with prothrombin deficiency resulting from bile obstruction, bile salts should be prescribed with menadione. The bisulfite preparation of menadione is superior in these cases.

3. High salicylate intake as in rheumatic patients, chronic aspirin users, and users of proprietary drugs which contain aspirin as their chief ingredient.

4. Therapeutic use of dicumarol in patients prone to thrombus formation lowers available prothrombin. This is due to the chemical configuration of dicumarol, which ultimately becomes salicylic acid in metabolism. There is an inverse relationship between salicylate intake and prothrombin available for the clotting mechanism.

The indiscriminate use of menadione to prevent postoperative hemorrhage in all patients is highly questionable. Careful interrogation of the patient will elicit such pertinent information as salicylate intake, rheumatic history, previous history of bleeding.

Menadione is indicated where hypoprothrombinemia exists. Prothrombin estimation is given as a percentage of normal. According to some authors, a bleeding tendency is not shown until the prothrombin falls to 20 per cent of the normal. However, most authorities give a much higher value, and recommend vitamin K therapy when the prothrombin level falls below 80 per cent.

If the patient suffers from improper clotting caused by other factors; namely, low platelet count as in purpura, or insufficient thromboplastinogen, as in hemophilia, menadione will prove of no value in preventing postoperative hemorrhage. Such patients should be hospitalized when any surgery is contemplated.

PREMEDICATION

Premedication of patients before general or local anesthesia, or even before extensive operative procedures, serves sev-

eral functions. Depending on the agent used, the following desirable effects are produced:

1. It calms the patient and lessens apprehension.
2. There is less tendency to resist the anesthetic, therefore (*a*) less anesthetic is necessary, hence there is a wider margin of safety, and (*b*) possible toxic effects caused by absorption of local anesthetics may be minimized.
3. Undesirable side effects can be controlled; namely, profuse secretions.

Pentobarbital Sodium • A patient can be premedicated with pentobarbital sodium (Nembutal Sodium) one hour before ordinary operative procedures such as extensive cavity preparation.

℞

Pentobarbital Sodium Capsules	0	1

Dispense six (6)
Do Not Repeat
Label: Take one (1) capsule an hour before dental appointment.

James Doe, D.D.S.

This prescription also can be used as a premedication for general anesthesia. It has the following advantages:

1. The onset is quick and the excretion time is short.
2. Patients will accept a lengthy procedure with much less apprehension and nervousness since this is a full hypnotic dose.
3. Toxicity caused by absorption of the local anesthetic is antagonized by barbiturates. Toxicity with local anesthetics of the procaine type occurs as a result of depression of medullary centers, following primary stimulation. Barbiturates antagonize this initial stimulant action.

Patients receiving barbiturates should always have some responsible individual accompany them to and from the office. The practitioner also should bear in mind that barbiturates are contraindicated in hepatic or renal disease, since the patient can not detoxify and excrete the drug properly. He also should be aware that barbiturates are capable of causing excitement in elderly patients.

Atropine Sulfate • The following prescription can be used to control secretions during local or general anesthesia, and also may serve as a stimulant to the respiratory center.

℞

Atropine Sulfate Tablets	0	0005

Dispense six (6)
Label: Take one (1) tablet an hour before dental appointment.

James Doe, D.D.S.

NUTRITION

Maintenance of the patient at a proper nutritional level is more the function of medicine than dentistry, but many times the dentist finds himself confronted by specific oral conditions suggestive of nutritional deficiency. Indeed, many nutritional deficiencies manifest themselves first in or about the oral cavity.

Inquiries into the patient's dietary history may disclose various deficiencies. Advice as to the proper foods with which to supplement the diet may aid in alleviating the condition. In some cases, however, the dentist may find it desirable to prescribe some specific supplement, or group of supplements.

In the following section the most common deficiencies encountered in dental practice are discussed, and appropriate prescriptions are presented.

A distinction should be made between so-called supplementary and therapeutic doses of vitamins. Supplementary dosage consists of simply aiding the patient in obtaining the daily requirements. The therapeutic dosages are sufficiently large to treat frank deficiency. Since the appearance of lesions in or about the oral cavity appears in the actual deficiency, therapeutic dosages are presented here.

The most recent revision of the National Research Council's recommendation of daily dietary allowances can be found on page 159 of the sixteenth edition of *Accepted Dental Remedies.*

Ascorbic Acid • Ascorbic acid is generally available in dosages ranging from 25 to 300 mg.

℞

Ascorbic Acid Tablets	0	30
Dispense one hundred (100)		

Label: One (1) tablet daily at afternoon meal.

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Ascorbic acid (vitamin C) is important for the maintenance of healthy gingival and periodontal tissues. Symptoms of a frank deficiency are rarely seen. Use of ascorbic acid as an adjunct to the instrumentative methods of treatment of periodontal disease has been suggested. Numerous studies, however, have failed to demonstrate a definite correlation between low intake of ascorbic acid and the occurrence of bleeding, "sponginess" and other symptoms of gingival disease. Thus the use of this drug for periodontal disease is largely empiric.

Symptoms connected with vitamin deficiency raise another interesting point. Usually a multiple deficiency exists before symptoms occur. This fact should be borne in mind.

Riboflavin • Riboflavin is available in both tablet and capsule form in dosages of 5 and 10 mg.

℞

Riboflavin Tablets, U.S.P.	0	005
Dispense fifty (50)		

Label: One (1) tablet three times daily.

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The chief reason for prescribing riboflavin in dentistry is in the treatment of lesions at the corners of the mouth (cheilosis), provided they are caused by this deficiency. Of course, cheilosis may occur from a variety of other causes. Many patients with cheilosis are not benefited by riboflavin alone. In this instance, it should be prescribed in conjunction with other members of the B complex.

ANTIHISTAMINIC AGENTS

A patient may exhibit idiosyncrasy to any agent prescribed. As common an agent as aspirin has been known to produce severe untoward reactions. Previous history aids in determining the possible occurrence of such phenomena. However, the patient may be receiving a drug for the first time. In addition, even if the drug has been administered many times before, sensitivity has been known to develop after use of an agent for a long period of time.

Unfortunately there is no ready way of foretelling whether any patient will exhibit idiosyncratic reactions to a drug. Many such reactions are similar to allergy.

When any agent is prescribed, the dentist should be ready to deal with this problem if it arises. In the following pages, prescriptions are written for "antihistaminic agents." Liberation of histamine in the body is considered to be the cause of allergic manifestations.

The most common symptoms of histamine liberation are:

1. Itching, generalized and local.
2. Appearance of rashes.
3. Sweating, weakness.
4. Feeling of coldness.
5. Edema.
6. Headache.
7. Difficulty in breathing.

If the attack is very severe, a subcutaneous injection of 0.1 to 0.5 cc. of 1:1000 epinephrine with massage will generally bring rapid cessation of symptoms.

Tripelennamine and Diphenhydramine Hydrochlorides • The following are two

of the most popular agents for the control of allergic phenomena:

℞

Tripelennamine Hydrochloride Tablets, U.S.P.	0	05

Dispense ten (10)

Label: Take one (1) tablet every four hours.

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This is the drug popularly known as Pyribenzamine.

℞

Diphenhydramine Hydrochloride Capsules, U.S.P.	0	05

Dispense ten (10)

Label: Take one (1) capsule every four hours.

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This is the drug popularly known as Benadryl. Ordinarily, oral administration of Benadryl and Pyribenzamine is effective against these symptoms. Their effectiveness is believed to be caused by their antagonistic action against histamine. Administration of Benadryl and Pyribenzamine frequently causes drowsiness. The patient should be warned of this possibility.

MOUTHWASHES

Many claims as to the therapeutic efficiency of mouthwashes have been made by manufacturers of proprietary preparations. For all practical purposes, the only function of the routine use of mouthwashes is a cosmetic one. Any statement as to their antiseptic value lacks foundation because of the following limiting factors existing in the oral cavity:

1. The great variety and number of microorganisms present.
2. The impossibility of bactericidal action without injury to the oral tissues.
3. The presence of protein, saliva, and locally stagnant areas.
4. The necessity for opening the mouth to speak and ingest food.
5. Communication with other passages.

The maximum effect any mouthwash can produce is to temporarily lower the bacterial count. This is not because of any antiseptic agent present in the mouthwash, but can be credited rather to the mechanical irrigation and flushing of the liquid. The same effect can be produced by washing with isotonic saline solution or distilled water.

Patients may request the dentist to recommend a specific mouthwash. The use of harmful proprietary preparations by the patient may be prevented by prescribing either of the following mouthwashes:

℞

Alkaline Aromatic Solution, N.F.	500	0

Label: Use as mouthwash by diluting with an equal quantity of warm water.

James Doe, D.D.S.

℞

Antiseptic Solution, N.F.	500	0

Label: Use as mouthwash undiluted.

James Doe, D.D.S.

Since these are National Formulary preparations it is not necessary to list all the ingredients in each. This is an advantage of prescribing official preparations.

As stated previously, the only recognizable function of the routine use of a mouthwash is cosmetic. From a psychological standpoint, a pleasant tasting mouthwash gives the patient a "fresh feeling." A transitory disappearance of unpleasant odors may also occur. No permanent effect in this direction can be achieved unless the actual cause of the bad odor is diagnosed and corrected.

Because of the anaerobic character of the bacteria held responsible for production of Vincent's stomatitis, the use of an oxidizing agent such as hydrogen peroxide is held by some to be rational.

℞

Hydrogen Peroxide Solution 500 | 0

Label: Mix three (3) tablespoonfuls with an equal volume of warm water and use as a mouthwash frequently.

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The strength of the hydrogen peroxide in the mouthwash can be varied according to the severity of the condition.

Unfortunately, self-medication with this chemical is common among the laity. The irritant effects of constant use (production of gingival and tongue changes), coupled with possible decalcification of tooth structure because of its acidity, render it a dangerous agent in the hands of an individual not under the supervision of a dentist.

An evaluation of intermediate base materials

John H. Mosteller, D.D.S., Mobile, Ala.

The insertion of an intermediate base beneath deep metallic restorations, such as those of silver amalgam, has been an accepted technic for well over a quarter of a century and one of the materials most frequently employed for this purpose has been zinc phosphate cement. The rationale of this operative procedure has been based on the desire to eliminate undue thermal shock to the pulpal tissues. The placement of an insulating layer of this relatively low thermal conductor between the cut dentin and the highly conductive metal filling has unquestionably aided in the conservation of vitality of many teeth. Some men, however, in their wish to satisfy the insulation requirement of an intermediate base have failed to concern themselves with the action of such a cement itself on the pulp.

Fifteen years ago histopathological evidence of the damage caused by cements containing orthophosphoric acid was reported and a number of investigators have substantiated this finding through the years. Manley[1] reported destruction of odontoblasts in young dogs' teeth filled with this type of cement. The teeth studied presented a shallow irregular layer of secondary dentin as well as round cell infiltration of the deeper pulpal tissues. Gurley and Van Huysen,[2, 3] in their work on dogs' teeth, observed a similar reaction in all but the most shallow cavities filled with zinc phosphate cement. They found the pulps hyperemic

1. Manley, E. B. Preliminary investigation into the reaction of pulp to various filling materials. Brit. D. J. 60:321 (April) 1936.

2. Gurley, W. B., and Van Huysen, Grant. Histologic response of teeth of dogs to operative procedures. J. D. Res. 19:179 (April) 1940.

3. Gurley, W. B., and Van Huysen, Grant. Histologic changes in teeth due to plastic filling materials. J.A.D.A. & D. Cosmos 24:1806 (Nov.) 1937.

and invaded with inflammatory cells, including some polymorphonuclear leukocytes, which resulted in a destruction of portions of the pulp's periphery adjacent to the pulpal ends of the dentinal tubules covered by the material. Irregular secondary dentin was deposited with its thickness varying inversely with the proximity of the floor of the cavity to the pulp. The irritating effect of this cement appears to cause a productive rather than destructive reaction in very shallow cavities and there is a deposition of a barrier of calcium salts at the pulpal ends of the affected tubules followed by the formation of tubular secondary dentin.

In subsequent experiments on noncarious young human teeth a similar microscopic picture was revealed.[4, 5, 6] Three weeks after such teeth were filled, Manley noted a diffused round cell infiltration of the pulps and many of the odontoblasts under the deepest part of the cavity were completely destroyed. The blood vessels of the pulps were dilated and hyperemic. Higher magnification showed inflammatory cells under the dentinal margin of even the shallow portion of the cavity with damaged and degenerated odontoblasts underneath. Nuclear changes such as karyorrhexis, karyolysis, and occasionally pyknosis occurred, all of which indicated necrosis.

The powder of this cement is composed basically of zinc oxide, while the liquid is essentially orthophosphoric acid which has a pH of 1.6, only slightly less acid than hydrochloric.[7] Warren Harvey[8] was able to burn a hole in a leather briefcase with the liquid of this preparation. The action of the acid on the powder is necessary to cause a set of the material, but unless a mix is made so dry that it is nearly impossible to manipulate, free acid is liberated in the cavity of the tooth. In tests determining the surface pH of mixes of 45 different brands of zinc phosphate cement, only five had a pH above 2.0.[6] At the end of 30 days the pH had risen to 7.3 as against 5.5 for silicate cement, [8] which perhaps accounts for the less severe reaction of the pulp to zinc phosphate cement than to the latter. However, it doesn't appear necessary for the cement to remain at a low pH in contact with the dentinal tubules for any extended period of time in order to cause a pathologic reaction in deep cavities. Such reactions were observed in teeth sectioned and studied 24 hours after the insertion of the material.[4, 6]

Lefkowitz[9] demonstrated decalcification of sound enamel under orthodontic bands cemented to place with zinc phosphate cement for seven days. The damage is evidently done almost immediately, however, for another group of investigators [10] found etching of the enamel which had been exposed to a mix of zinc phosphate cement for only an hour, with little further reaction after three hours and no increase after 6 or 12 hours of exposure. Both of these reports serve merely to emphasize the degree of acidity of a regular mix of this cement.

In a review of the literature, only two authors were found who did not indict this material for its damaging effect on the pulp when inserted in all but shallow cavities. While one of these papers[11] is only opinion, the other[12] is based on that author's interpretation of histologic sections. He not only exonerates zinc cement,

4. Seltzer, Samuel. Medication and pulp protection for deep cavity in child's tooth. J.A.D.A. 39:148 (Aug.) 1949.

5. Manley, E. B. Investigation into early effects of various filling materials on human pulp. D. Record 62:1 (Jan.) 1942.

6. Manley, E. B. Pulp reaction to dental cements. Proc. Roy. Soc. Med. Sec. Odont. 36:488 (July) 1943.

7. Skinner, E. W. The science of dental materials, ed. 2. Ch. 14. Philadelphia, W. B. Saunders Co., 1942.

8. Harvey, Warren. Dental materials with special reference to fillings. D. Gaz. 13:565 (June) 1947.

9. Lefkowitz, William. Histologic evidence of the harmful effect of cement under orthodontic bands. J. D. Res. 19:47 (Feb.) 1940.

10. Castello, I., and others. Effect of zinc oxyphosphate cement on enamel. Am. J. Orthodont. 34:271 (March) 1948.

11. Ringland, Pratt. Zinc phosphate cement. J. Den. Children 13:23 (first quarter) 1946.

12. Barker, J. N. Reactions of the pulp to various filling materials and clinical procedures. Austral. J. Den. 46:226 (Dec.) 1942.

but also silicate cement and the overheating of the pulp during operative procedures, of being responsible for any pulpal irritation. The other investigators of the reaction of the pulp to zinc phosphate cement agree that even more severe damage is caused by silicate cement or synthetic porcelain. Likewise, a number of research workers[13-16] have presented histopathological proof of injury to the pulp from irritation during cavity preparation. Most operators will agree that clinical experience verifies these observations. While it is true that the pulp and dentin have different gross physical properties, histologically they are connected by the cellular odontoblastic processes into a physiologic intimacy which precludes the irritation of one without the other.

Most reporters on the reaction of the pulp to various filling materials agree there is no noticeable change in response to a mix of zinc oxide and eugenol. Grant Van Huysen[2] has shown also that the insertion of this palliative will prevent the inflammatory changes that occur in the pulp because of injudicious operative procedures. He estimates that it requires 40 days for the pulp to subside from the inflammation caused by cutting a cavity half way through the dentin unless that cavity is filled with zinc oxide and eugenol. This protection has been demonstrated to be the same whether this material is used as a base or as the entire filling.[17] Glass and Zander[18] reported no microscopic evidence of true healing of healthy pulps mechanically exposed under sterile conditions and capped with zinc oxide and eugenol. At the end of eight weeks the site of exposure was still walled off with chronic inflammatory cells although the pulps remained clinically vital. Less inflammation was found when a paste of calcium hydroxide and tap water was applied under the zinc oxide and eugenol. At the end of four weeks, pulps capped in this manner demonstrated complete healing with a new layer of dentin and the formation of odontoblasts. It must be remembered that this work was done on exposed pulps and the tests were conducted to determine the influence of zinc oxide and eugenol on the healing process of the pulp rather than its nonirritating and palliative effect on this same structure when used as a covering for freshly cut dentinal tubules.

As a result of either or both of these studies and clinical experience, many operators insist on the routine use of zinc oxide and eugenol as a base in all cavities that penetrate the dentin to any appreciable depth. Some men[10, 20] prefer to fill such cavities in young patients with this material and then wait for a period before proceeding further with the restoration of the tooth. Since most dentists wish to insert the permanent restoration at the same sitting as the cavity is prepared, the use of this sedative material as a base is necessary. Reasons against such use are its extremely slow setting time and poor compression strength.

The setting time may be reduced by the addition of various salts such as aluminum nitrate, silver nitrate, aluminum acetate, silver acetate, or zinc acetate.[21] The silver salts discolor not only the base material but also, often, the tooth in which it is placed and the addition of

13. James, V. E., and Diefenbach, George. Prevention of histopathologic changes in young dogs' teeth by the use of zinc oxide and eugenol. J.A.D.A. 29:583 (April) 1942.

14. Van Huysen, Grant. Zinc oxide and eugenol in operative dentistry. J. D. Educ. 8:71 (Oct.) 1943.

15. Sagar, J. A. Reaction of dental pulp to filling materials. Austral. D. Mirror 13:1 (May) 1947.

16. Lefkowitz, William. Effect of operative procedures on noncarious teeth of young persons. J.A.D.A. 29:1864 (Oct.) 1942.

17. Manley, E. B. Experimental investigations into the early effect of various filling materials on the human pulp. D. Record 60:252 (July) 1940.

18. Glass, R. L., and Zander, H. A. Pulp healing. J. D. Res. 28:97 (April) 1949.

19. Scheu, C. H. Inlay and bridge abutment construction. J. Wisconsin D. Soc. 20:147 (Sept.-Oct.) 1944.

20. Welch, Isadore. Save that pulp. J. Canad. D. A. 13:371 (Aug.) 1947.

21. Harvey, Warren, and Petch, N. J. Acceleration of setting of zinc oxide cements. Brit. D. J. 80:1 (Jan.) 1946.

none of these chemicals measurably enhances the crushing strength.

The additions of both Staybelite resin, in varying proportions,[20-22] and asbestos powder[23] have been recommended to increase the crushing strength, and there are several similar proprietary preparations available to the profession. The maximum compression strength rating of any of these is about 4,500 pounds per square inch, which is considerably below the most effective packing pressure of amalgam. To compensate for this inherent weakness of a zinc oxide and eugenol preparation some men advocate covering such a sedative base with a layer of regular zinc phosphate cement. This requires the mixing of two materials for each cavity as well as the risk of the zinc phosphate cement's being dislodged during the heavy condensation needed for amalgam. Others, desiring the stronger foundation, suggest the use of a varnish to protect the dentinal tubules from the orthophosphoric acid. Most cavity varnishes can be impregnated by this acid and therefore cannot be relied on.[4, 24, 25]

A satisfactory base material should possess not only the sedative qualities of a mixture of zinc oxide and eugenol but also have sufficient strength to provide a substantial foundation for the immediate insertion of a well condensed amalgam restoration. It is desirable not only to eliminate the pulpal irritation of the orthophosphoric acid but also to provide this sedative treatment in order to prevent the inflammation caused by mechanical intervention during cavity preparation. Since the palliative effect of eugenol on the pulp is well established it seemed reasonable to conjecture that its addition to a mix of zinc phosphate cement might obscure the irritating qualities of the orthophosphoric acid as well as prevent the inflammatory changes so frequently caused by cavity preparation, and at the same time not reduce the strength of the cement below an acceptable limit.

PREVALENCE OF SENSITIVE FRESHLY FILLED TEETH

The questioning of 300 patients whose mouths each contained several extensive amalgam restorations revealed that 267, or about 75 per cent, recalled that one or more of these teeth had been sensitive to thermal changes after being filled. According to the memories of these patients, this sensitivity lasted anywhere from a few days to several months. Undoubtedly, many of these exacerbations were caused by the failure of the operator to use any type of base material rather than from irritation of orthophosphoric acid or a rapid cutting technic. The patients' answers seemed to indicate that the sensitive freshly filled tooth is more frequently the rule than the exception. This was the opinion harbored by the majority of the patients questioned.

CLINICAL TESTS WITH ZINC PHOSPHATE CEMENT

Twenty-five cavities of varying depth and location in carious, not previously filled, teeth of 25 individual patients, from 9 to 31 years of age, were prepared and filled with a thick mix of zinc phosphate cement and checked for thermal sensitivity at one, two, three, and four weeks intervals. Seventeen of these patients complained of sensitivity to cool water at the end of the first week. Subjective symptoms are hard to evaluate but all 17 described paroxysms which lasted as long or slightly longer than when cool water (56° F.) was applied. This sensitivity persisted in all 17 cases for the second

22. Jasper, E. A. Dental pulp and contiguous structures: clinical considerations. J.A.D.A. 32:1412 (Nov.-Dec.) 1945.

23. Jamesson, Paul. Pulp insulation and capping: preliminary report. N.Y. D. J. 14:441 (Oct.) 1948.

24. Zander, H. A., and Peiko, Irene. Protection of pulp under silicate cements with cavity varnishes and cement linings. J.A.D.A. 34:811 (June 15) 1947.

25. Lopez Romay, R. J. Pulp death due to silicate cement fillings. Rev. Odont. 29:539 (Sept.) 1941.

and third weeks and in 15 of the group for the fourth week, although all but three described the painful sensations as less noticeable at this time than at the end of the first week. Of the teeth filled, those with incipient proximal caries, usually requiring bitewing roentgenograms to detect, appeared to be more sensitive than badly broken down teeth with deep leathery decay. The opportunity for secondary dentin formation in response to the stimulation of advancing decay in the latter teeth plus the demand for greater mechanical intervention with the cutting of many more fresh dentinal tubules in the former probably accounts for this difference.[26] Relatively young patients were selected in order to have teeth with more permeable dentin and because a majority of the virgin cavities are found in such patients.

ZINC PHOSPHATE AND EUGENOL CEMENT

Since it was not possible to make a histological study of the pulp, it was necessary to limit this investigation of the aforementioned zinc phosphate and eugenol cement to its clinical and physical properties.

Twenty-five similar cavities were prepared in the teeth of the same 25 individuals who took part in the first tests with regular zinc phosphate cement, the operative technic being essentially the same, principally diamond instrumentation. These cavities were filled with a zinc phosphate cement which was modified by using equal parts of eugenol, U.S.P. and the commercial liquid. Interviews with these patients at the same intervals over a four week period disclosed that none of the teeth were sensitive to cool water (56° F.).

Subsequently over 3,000 cavities in the teeth of approximately 600 patients were restored with amalgam using this eugenol-phosphate cement as a base. While each of these teeth was not tested individually with cool water, every patient was questioned as to any sensation of thermal change in the freshly filled teeth. This inquiry resulted in the complaint of a sensitive tooth in 6 cases. Three of these teeth, all with near-exposures of the pulp, ultimately developed periapical abcesses and required extraction, which indicates that their pulps were either of low vitality preoperatively or were irreparably damaged during cavity preparation. The sensitivity of the other three teeth subsided within six weeks after placement of the fillings. Two other patients experienced a true odontalgia for two or three hours immediately after the local anesthesia wore off. Neither of these teeth was sensitive to hot or cold when patients returned to the office 24 hours later, and both teeth were found to be normally vital at their last examinations which were made respectively nine months and two years later.

The value of this addition of eugenol is apparently due to its established sedative action on the pulp rather than to any reduction in the acidity of the cement. Using a Yonden pH meter,[27] which is a quin hydrone electrode type apparatus, the pH of the liquid of the cement[28] which was used in all of these cases both with and without the addition of eugenol, was found to be 3.14. Eugenol exhibited no pH reading whatsoever because of its lack of free hydrogen ions. By the addition of equal parts of distilled water and eugenol and boiling for 30 minutes the solution became a conductor and gave a pH reading of 6.8. It is therefore evident that the eugenol is incapable of neutralizing the orthophosphoric acid.

The table gives the ultimate crushing strength, as determined by the author, of

26. Thomas, B. O. A. Protective metamorphosis of dentin: its relationship to pain. J.A.D.A. 31:459 (April) 1944.

27. Through the cooperation of the chemistry department, Spring Hill College, Spring Hill, Ala.

28. S. S. White Zinc Cement, Improved.

Table • Crushing strength of zinc phosphate cement with and without eugenol

Zinc phosphate and eugenol cement			Unmodified zinc phosphate cement		
Diameter of specimen in mm.	Actual load in lbs.	Crushing strength in lbs. per sq. in.	Diameter of specimen in mm.	Actual load in lbs.	Crushing strength in lbs. per sq. in.
3.98	205	10,563	3.90	310	15,973
4.00	215	11,008	3.95	300	15,735
3.95	210	11,014	4.00	310	15,873

Approximate 4 x 8 mm. cylindrical specimens; compressed 5,152 lbs. per sq. in. per minute.

the cement used,[28] with and without the addition of eugenol. The average strength for a regular mix was found to be a little less than 16,000 pounds per square inch and slightly less than 11,000 pounds per square inch for the sedative mix. This approximately 30 per cent reduction in strength caused by the addition of the eugenol might seem to warrant the condemnation of such a preparation as a base material. However, if this data is evaluated properly, it is found that this lower compression strength rating adequately fulfills the requirements of a satisfactory intermediate base. The tests were made on a Baldwin-Southwark-VonHeydekampf hydraulic testing machine[29] on the thousand pound range at the speed of compression of 100 pounds per minute or 5,152 pounds per square inch per minute.

Skinner[30] has found that the flow of amalgam is reduced proportionally as the packing pressure is increased up to about 8,000 pounds per square inch. Heavier condensing than this causes a slight further reduction in flow that is of academic interest only. It requires a heavy 10 pounds thrust to exert this much packing pressure with a condenser 1 mm. in diameter. With 2 and 3 mm. instruments a 40 and 90 pounds thrust respectively would be required to exert this 8,000 pounds per square inch of packing pressure, which is obviously out of the question.[31] About a 12 to 15 pounds thrust is the maximum that can be safely executed in the mouth and it requires concentrated effort to condense with a 10 pounds thrust consistently. It is therefore evident that the crushing strength of the base material under discussion is sufficient to withstand the most effective packing pressure of amalgam.

For a heavy yet easily manipulated mix of cement,[28] 4.5 grains of powder are required for each drop of liquid (0.07 cc.), thus the usual two-drop mix requires 9 grains of powder. To obtain a mix of like consistency when using one drop of commercial liquid and one drop of eugenol, only 5.5 grains of powder are needed. This is because eugenol will mix with zinc oxide in equal parts by weight. Therefore, a two-drop mix of this altered preparation will require only slightly more than one half the amount of powder employed in a two-drop mix of zinc phosphate cement, regardless of the brand used. As the commercial liquid and the

29. Through the cooperation of the L. D. Caulk Company, Milford, Del.

30. Skinner, E. W. The science of dental materials, ed. 2. Ch. 24. Philadelphia, W. B. Saunders Co., 1942.

31. Mosteller, John H. The principles of condensation of amalgam. J. Georgia D. A. 24:10 (July) 1950.

eugenol are nonmiscible they cannot be combined in one bottle but must be placed on the slab individually.

While the setting time is reduced by the addition of the eugenol, sufficient working time still remains. A relatively heavy mix is recommended, for such a mix allows more of the orthophosphoric acid to combine chemically with the powder, thus reducing the sedative demands on the eugenol. The idea is to pack the material into place rather than to "flow" it, as some men refer to the placement of thin mixes.

CONCLUSION

Since microscopic studies suggest that zinc phosphate cement is injurious to the pulp when placed in all but shallow cavities, its use as an intermediate base seems to be contraindicated. And likewise, since there is further histological evidence of pulpal insult from the mechanical intervention of cavity preparation unless the cavity is filled, either partially or totally, with a mix of zinc oxide and eugenol, the use of a sedative type base material seems to be definitely beneficial. From clinical tests, sensitive freshly filled teeth appear to be common when zinc phosphate cement is used as a base. While it is difficult to ascertain accurately how much of this discomfort is due to the low pH of the cement and how much is caused by operative procedures, such exacerbations were almost completely eliminated in over 3,000 cases by the use of equal parts of eugenol and the liquid of the cement.

Most operators know the importance the average patient places on the absence of pain in the dental chair and as a result local anesthetics are sold to the profession in voluminous quantities. Postoperative annoyances and discomforts should be eliminated also.

In view of the fact that the compression strength of zinc phosphate and eugenol cement far exceeds that of any other sedative preparation suggested in the literature and furthermore, since it is capable of withstanding the most effective packing pressure of amalgam, it seems to fulfill more nearly the requirements of an ideal base material. The histological study of its effect on the pulp is worthy of further research.

307-08 Graystone Building

Perspective • To look at his picture as a whole, a painter requires distance; and to judge of the total scientific achievement of any age, the standpoint of a succeeding age is desirable. *John Tyndall, "Science and Man," Fragments of Science, The Scientific Monthly 72:232, April, 1951.*

Analysis of airbrasive procedures in dental practice

Sidney Epstein, D.D.S., San Francisco

Airbrasive procedure and its equipment have been available to the profession now for a sufficient period of time that it is well to evaluate the instrument and the procedure critically in terms of their practicability and their limitations.

Airbrasive technic is based on the principle that particulate matter propelled at high velocity will abrade the contacting surface. The abrasive action is the result of the expenditure of kinetic energy. It is apparent to those who have used, or observed the use of, the airbrasive procedure that the principle is fundamentally sound and is applicable to operative dentistry. It is apparent also that there are fundamental limitations and it is important for the operator to be appraised of these limitations. There are instances where the use of the airbrasive technic alone may be sufficient, just as it is possible to complete a cavity preparation with a single bur. However, most frequently, airbrasive must be supplemented by the use of rotary instruments and hand instrumentation.

One fundamental limitation is that with airbrasive procedures it is only possible to cut sound or intact enamel and dentin rapidly. Carious enamel and dentin cut at a much slower rate or do not cut at all. Metallic restorations cut very slowly by airbrasive, as compared to rotary instruments. Some amalgam restorations may be literally blown out of the cavity while others take a considerable period of time to make any penetration. This does not appear to be dependent on the consistency of the mix or the method of packing the amalgam. The reason still remains to be investigated. Gold alloys and gold foil also cut very slowly. In most instances it is possible to remove metal restorations rapidly only by cutting around their circumference, which increases the occlusal extension of the cavity and weakens the cusps and margins.

AIRBRASIVE IN PROPHYLACTIC PROCEDURES

In order to remove stains and deposits from the exposed surfaces of the teeth, dolomite (magnesium calcium carbonate) is used at a pressure of 40 pounds with an approximate flow of 4 to 5 Gm. of abrasive per minute. The abrasive is directed against the tooth surface at an angulation of about 45 degrees at a nozzle tip distance of approximately 30 mm. With the dolomite it is possible to remove readily and rapidly the adherent green stains on teeth of children and the adherent brown stains found on the gin-

Associate, dental research, College of Physicians and Surgeons School of Dentistry.

gival third of the teeth of young adults. It is possible also to remove the supragingival calculus as well as subgingival calculus down to the base of the deflected gingiva as it is forced back by the gaseous stream. This is particularly true on the labial and lingual surfaces of the teeth. It is possible also to remove some of the interproximal calculus if the embrasures are wide as, for example, where there has been considerable gingival recession. After teeth have been cleaned with airbrasive, they lose their high vitreous luster and have a dull satin-like appearance. However, the luster can be restored readily by polishing with a rubber cup and a fine polish. Even if no repolishing is done, the teeth again resume a normal clinical appearance after three or four days.

EFFECTS ON ENAMEL

In the only available reported studies to date, made by Bailey and Phillips[1] it was shown that there was a definite change in the microscopic character of enamel cleaned with airbrasive dolomite in contrast to enamel cleaned with a rubber cup containing flour of pumice revolving at 5,800 rpm. The air abraded enamel was pitted whereas the enamel polished with a rubber cup and pumice showed fine light scratches. Whether this is significant and sufficient to affect the integrity of the tooth is not known. The dulling effect of airbrasive was measured and it was found that the luster loss of the enamel was 48 units as compared to only 6 units when pumice was used. The authors also stated that the dulling effect can be removed by repolishing with levigated alumina. It was demonstrated that with a nozzle tip distance of 1 mm., 106 micra of enamel was lost at the end of 15 seconds. At a nozzle tip distance of 15 mm., 6 micra of enamel loss was shown after 15 seconds. Flour of pumice in a rubber cup revolved at 5,800 rpm for 25 seconds caused 4 micra enamel loss.

Enamel loss is not merely directly proportional to the duration of the application but it is also inversely proportional to the nozzle tip distance. There are inherent dangers in a failure to maintain nozzle tip distance as well as in failure to maintain correct angulation in order to get a deflection of the particle from the surface to reduce the pitting effect. Nozzle tip distance is the important factor in determining the extent of abrasion, but there is a technical difficulty in maintaining that distance because of lack of digital contact and control.

Further destruction to the teeth may result from carelessness or when a higher propellent pressure and greater rate of flow of abrasive are used because of haste. There is also the very real danger of failure to flush the tubing and handpiece free of cutting material as well as failure to switch from the reservoir of cutting abrasive to the polishing abrasive.

Undue abrasion of exposed cementum will be produced where an attempt is made to remove heavy adherent deposits of calculus. Airbrasive procedure does not in any sense replace the need for careful, extensive and diligent subgingival scaling with suitable curettage. In our experience with unilateral half-mouth studies, a dental hygienist was able to complete the scaling and polishing of the selected half mouth in approximately the same amount of time and with better results than an operator using the Airdent. Stippling of the gingival margins with the airbrasive powder also was noticed after polishing the teeth.

CAVITY PREPARATION

The fundamental use of the airbrasive procedure is for extensive cutting of intact enamel and dentin. Airbrasive will cut sound or intact enamel or dentin rapidly. One who has mastered the tech-

1. Bailey, L. R., and Phillips, R. W. Effect of certain abrasive materials on teeth. J. D. Res. 29:740 (Dec.) 1950.

nic readily can prepare the outline form of any of the five classifications of cavities within the limits of his visibility. Establishing outline form with airbrasive, however, requires more dexterity, practice and careful consideration than when a rotary instrument is used. It is necessary to predetermine carefully and, if possible, to indicate the outline of the proposed cavity extension. It differs from the use of a bur in that it is difficult to extend a preconceived outline in two dimensions without increasing the third dimension or depth of the cavity. It is possible to prepare at least 75 per cent of the cavity outline in a tooth with initial caries using the airbrasive. However, the remaining 25 per cent, more or less, of the cavity detail, that is, the careful and accurate finishing of cavity walls, especially the gingival wall, the placing of retention form and the removal of remaining caries, must be completed with rotary drills or hand instruments.

In preparing cavities in teeth with initial caries, the airbrasive finds its greatest use. It is most useful in a practice that has many children and young adults with initial caries attacks. Among patients who have had considerable dental work done previously and where much of the operative procedure is devoted to replacements, reconstruction and rehabilitation of older restorations, the use of airbrasive technic is limited. As indicated earlier, the limitations are due to the lack of speed and the difficulty in cutting through metal restorations, or in cutting around restorations to remove them which necessitates increasing extensions and further weakening a tooth. Moreover, another limitation is the inability of the airbrasive to remove soft carious tooth structure once the restoration has been removed. The use of the rotary instrument in such instances makes it possible to remove an old restoration more rapidly and at the same time make the extensions indicated and remove the carious areas.

USE OF RUBBER DAM

Satisfactory use of airbrasive in operative procedure requires the placement of the rubber dam to isolate the field of operation. The rubber dam is essential to provide a completely dry field in order to prevent the formation of moist residue or mud that will prevent cutting. The rubber dam increases visibility which is so essential. It increases the efficiency of the recovery mechanism in gathering back the spent abrasive powder as well as the tooth debris, and protects the patient against aspiration of abrasive and powdered tooth. Much study remains to be done to reduce the possible hazards to the patient as well as to the dentist. Where a tooth can be isolated with cotton rolls and dryness of field maintained, it is possible to operate without the use of the rubber dam. In such instances, much of the free fine abrasive and debris is caught by the moisture of the mouth and the moisture of the cotton rolls. The debris accumulates in the mouth very rapidly. Patients usually are not disturbed by the accumulation of the debris even when the tongue, palate and the buccal surfaces are heavily coated. Lips are usually sensitive to the abrasive stream but gingival tissues are not.

ADDITIONAL CONSIDERATIONS

Another problem in airbrasive procedures is that the important guide of tactile sense is not possible. Therefore, direct and clear visibility is a necessity. It is impossible to keep the dental mirror clear of powder to provide a working image. Damage to the polished accurate surface of the mirror occurs all too readily. If any part of the abrasive stream strikes the mirror it is immediately fogged. If abrasive powder gets on the mirror and one inadvertently rubs it off with his fingers, the surface is scratched. If the mirror is wiped on the towel used to protect the patient, it also may be scratched

by the abrasive particles that have not been picked up by the recovery mechanism and are embedded on the towel's surface. Mirror surfaces can be protected by using a transparent plastic spray or cellulose acetate disks. Etched mirrors need not be discarded since glass surfaces can be restored easily by using the dental lathe with pumice stone, tripoli and gold rouge. Eye glasses, loops and mirrors should be rinsed under a strong stream of water before drying and polishing.

While one is free from physical fatigue common to use of the dental handpiece, there is more eye fatigue in the use of the airbrasive since vision is the only guiding control. The cutting stream must be watched at every moment. The use of a rotary instrument or hand instrument allows for tactile guidance and visualization of the surface being cut and requires less intense effort. In first using the airbrasive there is considerable hand fatigue due to the great tenseness in attempting to maintain some form of hand control. However, as confidence is gained, it requires considerably less physical effort than the rotary handpiece. It is best to cut where the abrasive stream can be observed. It is unwise to make cuts on surfaces where direct vision is not possible.

Fear of pain is one of the important factors that strongly deters patients from visiting their dentists. Any publicity that may be given to the airbrasive principle as being painless will be unfortunate both for the patient who comes unsuspectingly as well as for the profession. The amount of pain that the patient experiences will in a great measure depend on the patient's individual pain threshold. The pain will be further increased by apprehension and fear of the usual instrumentation that is still essential. While there is no question that the airbrasive principle is of great benefit, real pain is caused at times by the frictional force of the airbrasive particles and discomfort is experienced because of the reduction of the surface temperature of the tooth. Local anesthetics should be used, not only to allay the pain of the airbrasive, but for the other phases of operative procedure that are a necessary part of the over-all tooth restoration; namely, placement of the rubber dam clamps, supplementary instrumentation, whether it be the use of rotary instruments or hand instruments to make terminal extensions and remove carious material or the placing of matrices and restorations. If anesthesia is not used there will be a certain amount of reluctance or resistance on the part of the operator to complete satisfactory preparation of the cavity and a consequent lowering of the quality of the operator's dentistry.

ECONOMIC FACTORS

In a realistic approach, the cost and physical dimensions of the machine are a necessary consideration. In a small operating room its size presents certain physical handicaps and many inconveniences. The apparatus does not make it possible to do more dentistry of superior quality or as much dentistry of the same quality in the same length of time as the conventional procedure. If experience of others proves this to be true, then income based on units of work completed would be less and unless a commensurate fee increase was made, the gross income of the dentist would be less. However, experience increases operating speed. For a man beginning the practice of dentistry or beginning again in a new community where the "practice builder" might be necessary to supplement his skill and knowledge, the airbrasive may have great value. If one has a well established practice and one's time is filled to capacity, this innovation becomes somewhat of an obstacle. It becomes an added expense to the office and will not bring sufficient returns to compensate for the time and money for postgraduate training as well as for the cost of purchasing and maintaining the equipment.

Patients are most receptive to airbrasive procedure and can be convinced easily of its virtues and acclaim them. For example, if the prophylaxis is done without scaling, the patients are appreciative of that fact, not realizing the incompleteness of the prophylactic procedure. The patients are grateful also for the fact that there are no rotary drills and for the absence of vibration and bone conducted sound. Many dislike the noise of the recovery apparatus (suction used) which is disturbing also to the operator if the operating room is too small. This factor of noise may be corrected by the use of baffles in the recovery mechanism. The recovery mechanism is not a hundred per cent efficient as evidenced by the amount of adherent powder around the operating room. The recovery vent also interferes with full range vision. The machine is too heavy to be easily moved from one operating room to another. Its physical size and position also make it difficult for the dental assistant to give correct or adequate chairside assistance in an office of limited space. It becomes a real obstacle and hindrance to good teamwork between dentist and nurse.

SUMMARY

Airbrasive has been defined and its fundamental advantages and limitations have been set forth. Airbrasive technic can be made a part of operative procedure but it requires supplementary instrumentation. Its greatest use is in preparing outline form in teeth with initial caries. The factor of pain should not be minimized. Patients are most receptive to airbrasive procedures.

To Live Dynamically • Yet we must know, if only in order to learn not to know. The supreme lesson of human consciousness is to learn how not to know. That is, how not to interfere. That is, how to live dynamically, from the great Source, and not statistically, like machines driven by ideas and principles from the head, or automatically, from one fixed desire. At last, knowledge must be put into its true place in the living activity of man. And we must know deeply, in order even to do that. *D. H. Lawrence, "Fantasia of the Unconscious."*

Nutritional aspects of periodontal therapeutics

Neal W. Chilton, D.D.S., M.P.H., Trenton, N. J.

In 1912, Casimir Funk,[1] one of the pioneers in nutrition research, stated, "there is perhaps no other subject in medicine where so many contradictory and inexact statements were made, which instead of advancing the research retarded it by leading investigators in a wrong direction." In 1948, 36 years later, Richard Follis[2] stated, "unfortunately, what he [Funk] said then, still holds true today." These statements were made in reference to the general field of medicine, but they are just as applicable to dentistry. The two disorders of the oral cavity most frequently encountered are dental caries and periodontal disease. It has been fairly widely accepted that refined carbohydrates in the diet are an important factor in the etiology of dental caries, but the role of nutrition in the etiology and therapy of periodontal disease is still a much debated subject.

One has only to read the excellent review by Schour and Massler[3] to realize that there is much contradictory evidence on the relation of nutritional deficiencies to periodontal disease. Take as an example the role of vitamin C deficiency which has received a great deal of attention and space in dental literature. Much has been written on the production of gingival and periodontal disease by ascorbic acid deficiency. A deficiency of this vitamin produces a general failure in the deposition of intercellular cement substance attended by rupture of capillaries.[2] In scorbutic animals it has been shown that the principal fibers of the periodontal membrane become detached from the alveolar bone, which then becomes resorbed, producing changes similar to those which are often seen in periodontal disease.[4] The hemorrhagic tendencies seen in scurvy also may have their counterpart in gingival bleeding.[5] Working from these experimental findings, some clinicians have indicted vitamin C deficiency as an underlying cause of gingivitis[6] and others have reported excellent results with vitamin C therapy.[7] On the other hand, other investigators have found no correlation between low blood plasma levels of ascorbic acid and

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Assistant clinical professor of pharmacology and therapeutics, New York University College of Dentistry, New York.

1. Funk, C. The etiology of the deficiency diseases. J. State Med. 20:341, 1912.

2. Follis, R. H., Jr. The pathology of nutritional disease. Springfield, Ill., Charles C Thomas, 1948.

3. Schour, I., and Massler, M. The effects of dietary deficiencies upon the oral structures. J.A.D.A. 32:714 (June); 32:871 (July); 32:1022 (Aug.); 32:1139 (Sept.) 1945.

4. Boyle, P. E.; Bessey, O. A., and Wolbach, S. B. Experimental alveolar bone atrophy produced by ascorbic acid deficiency and its relation to pyorrhea alveolaris. Proc. Soc. Exper. Biol. & Med. 36:733 (June) 1937.

5. Tomlinson, T. H., Jr. Pathology of artificially induced scurvy in monkey—with and without chronic calcium deficiency. Pub. Health Rep. 57:987 (July 3) 1942.

6. Stuhl, F. Vitamin C subnutrition in gingivostomatitis. Lancet 1:640 (May 22) 1943.

7. Kruse, H. D. Gingival manifestations of avitaminosis C, with especial consideration of detection of early changes by biomicroscopy. Milbank Mem. Fund Quart. 20:290 (July) 1942.

the average case of gingivitis,[8] and therapy with vitamin C has produced no appreciable results.[9]

With such contradictory evidence merely with one nutritional element, what is the average practitioner going to do? Should he prescribe vitamin supplements for every case of bleeding gums or "pyorrhea" as the pharmaceutical houses recommend, or should he completely ignore the nutritional aspects of oral disease, or should he assume a rational clinical approach to this problem? It is the purpose of this paper to try to present such a rational clinical approach to the subject of nutritional aspects of periodontal therapeutics.

It is important for the dentist to pay attention to this subject for two basic reasons. First, the highly specialized tissues of the oral cavity are often the first areas to be affected by nutritional disturbances. The dentist who sees his patients regularly is in an excellent position to notice these changes and can assess the role of local factors as well. Second, it is often impossible to achieve really successful results of treatment if nutritional concepts are ignored.

A BASIC CLINICAL STUDY

Probably the main reason for conflicting opinions on the role of nutrition in the etiology of gingival and periodontal disease is the comparative lack of carefully controlled clinical studies. Fortunately, there are a few excellent studies, one of which is applicable to this discussion. Not only is it an excellent model for experiments of this kind but the results offer a rational approach to the relation of nutrition and periodontal disease. In 1942 through 1944, the Royal Canadian Air Force studied the relation of ascorbic acid intake to gingivitis in their personnel.[10] They divided their subjects into various groups and studied the effects of different supplements on existing gingival inflammation. They also studied the effects of ascorbic acid on the gingivae of individuals in whom all local irritational factors were removed at the beginning of the study. These experiments were performed on healthy young men, whose diets were completely controlled. The studies were conducted by well-qualified dentists, physicians and technicians, and the findings were subjected to careful statistical analyses. The findings are well worth quoting:

> Inflammation of the gingivae was commonly found among the apparently healthy young adults examined.
>
> Study number 1 demonstrated that the administration of large amounts of vitamins A and D, thiamin, riboflavin, nicotinic acid and ascorbic acid for a period of 5 months had no clinical effect on pre-existing inflammation of the gingivae.
>
> Study number 2 indicated, and study number 3 confirmed that when gingivitis was cleared to a maximum degree by local treatment the provision of approximately 75 mgs. of ascorbic acid daily (minimum daily requirement of National Research Council) had a delaying effect on the recurrence of signs of inflammation over that which occurred when 10 mgs. ascorbic acid daily was provided.
>
> The results also suggested that a diet containing 75 mgs. of ascorbic acid retarded the recurrence of gingivitis to a greater degree than 25 mgs. of ascorbic acid per day.

The study also demonstrated that neither 25 mg. nor 10 mg. of ascorbic acid daily were effective in retarding the return of gingivitis, and that the minimum daily requirement could be taken in natural dietary form or in supplement form to retard recurring gingivitis.

The authors[10] further state, "the results here recorded show that gingivitis recurs after local treatment more frequently in individuals receiving a low

8. Burrill, D. Y. Relationship of blood plasma vitamin C level to gingival and periodontal disease. J. D. Res. 21:353 (Aug.) 1942.

9. Marshall-Day, C. D., and Shourie, K. L. Effect of vitamin C on gingival and periodontal disease in Indian children. Indian J. M. Res. 31:153 (Oct. 2) 1943.

10. Linghorne, W. J., and others. Relation of ascorbic acid intake to gingivitis. Canad. M. A. J. 54:106 (Feb.) 1946.

ascorbic acid intake than in those receiving a high ascorbic acid intake." It is important to note that the histologic appearance of the tissues examined in these studies in no way resembled the changes seen in scurvy. It might therefore be stated that subclinical nutritional deficiencies of this sort predispose the oral tissues to disease. Local factors superimposed on these predisposing systemic factors then produce the clinical changes seen. These systemic factors may be other than nutritional in nature, and the greater their imbalance, the greater the periodontal destruction in the presence of similar local factors. The experimental findings of Glickman,[11] evolving in his "bone factor" concept, offer convincing evidence of the role of underlying systemic factors (of which nutritional inadequacy may be a part) in the etiology of periodontal disease.

MODERN CONCEPT OF MALNUTRITION

Nutritional deficiency, or as is more commonly found according to many surveys, subclinical nutritional deficiency, can therefore be considered as a predisposing factor in periodontal disease. But, actually, what is a subclinical deficiency? One can read that patients with pellagra become well overnight with niacin therapy, patients with scurvy are fine after getting vitamin C, and so on. This type of all-or-none reaction, however, does not hold true in the nutritional inadequacy states. Furthermore, diet and nutrition are not synonymous terms. A chronic deficiency differs from an acute deficiency. A rational approach to the treatment of deficiency states can only be obtained by an understanding of the fundamental concepts involved in the production of nutritional inadequacy. These concepts, as developed by Jolliffe,[12] Kruse[13] and others, will be discussed.

The nutritional inadequacy states are based on either a dietary (or primary) inadequacy, or on a conditioned (or secondary) inadequacy. When an individual is placed on a dietary intake which is lower than his minimal requirement of one or more nutritional elements, a whole series of changes occur before the classic signs of nutritional deficiency disease become manifest. The first change taking place in primary inadequacy is tissue depletion, the reduction of the amount of the nutritional element stored in the tissues. The speed of tissue depletion depends on the degree of nutritional inadequacy, the amount of nutrient reserves, and the requirement of the body for essential nutrients. When tissue depletion has reached a critical level, certain biochemical "lesions" may become apparent. These changes cannot be seen by the clinician, but the biochemist can find, for example, an accumulation of pyruvic acid in the blood and tissues in thiamin deficiency. The next stage in primary inadequacy is that of functional (or physiologic) changes. Although these changes are nonspecific, in that they can be caused by many nonnutritional disturbances, definite functional changes can be demonstrated in nutritional inadequacy. For example, inability to see in dim light has been related to vitamin A deficiency. The next stage in the sequence is the appearance of subgross anatomic lesions which can be diagnosed only through the use of the slit lamp opthalmoscope or biomicroscope. Kruse has demonstrated changes in the lingual papillae in niacin deficiency, corneal changes in riboflavin deficiency and interdental papillae changes in ascorbic acid deficiency by the use of the biomicroscope, before these changes could be seen by the naked eye. When the next stage of gross anatomic lesions has oc-

11. Glickman, I. The experimental basis for the "bone factor" concept in periodontal disease. J. Periodont. 20:7 (Jan.) 1949.

12. Jolliffe, N. Handbook of nutrition: conditioned malnutrition. J.A.M.A. 122:299 (May 29) 1943.

13. Kruse, H. D. A concept of deficiency states. Milbank Mem. Fund Quart. 20:245 (July) 1942.

curred, the careful clinician is able to discern these changes. They have been described so often that it is unnecessary to mention them here, beyond stating that such lesions are not pathognomonic of nutritional inadequacy states and can be produced by a variety of conditions. If the inadequacy state is allowed to continue, it will in time lead to one of the classic deficiency diseases, and if uncorrected, eventually to death. Thus it is obvious that when the clinician diagnoses signs of a nutritional inadequacy, he does so after a whole train of stages has taken place, and not, as so many have thought, at its earliest occurrence.

The distinction between diet and nutrition becomes apparent when conditioned (or secondary) nutritional inadequacies are examined. The primary deficiencies states occur when the diet is inadequate; the secondary nutritional inadequacies occur when the diet available to the patient is adequate, but something prevents the tissues from receiving the full nutritional benefits from the diet. Dentists interested in oral medicine and periodontology should be familiar with these conditioning factors, since the success or failure of their treatment, and the diagnosis of oral lesions in the presence of an adequate diet, may sometimes depend on the recognition of these factors.

1. Factors interfering with ingestion:

Gastrointestinal disorders preventing the eating of certain foods (peptic ulcers, gallbladder disease, colitis) (Fig. 1, 2).

Neuropsychiatric disorders interfering with self feeding.

Food allergy; nausea in pregnancy and other conditions; therapeutic diets which restrict ingestion of essential foods; and disorders of mastication, such as jaw fractures, loss of teeth, poor dentures or no dentures.

2. Factors increasing nutritive requirement:

Increased physical activity, as in delirium, unusually hard work and certain psychoses.

High fever; hyperthyroidism; pregnancy and lactation; and therapeutic procedures such as thyroid feeding, fever therapy, intravenous glucose and high carbohydrate diets (increasing requirements for B complex vitamins).

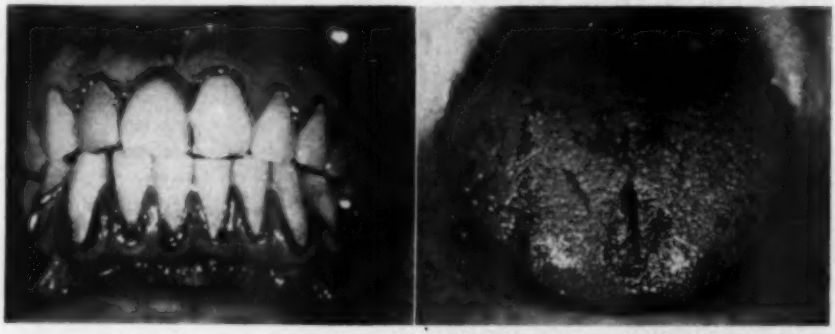

Fig. 1 • Left: White female, 32 years old, with secondary nutritional inadequacy due to inability to eat foods containing vitamins C and B complex because of a low grade ulcerative colitis. A low residue diet and therapeutic polyvitamin capsules were prescribed along with routine conservative periodontal therapy. Right: Same patient as at the left, showing fissuring and atrophy of papillae of the tongue. Patient complained of severe burning pain from the tongue (glossodynia)

Fig. 2 • Left: Same patient as shown in Figure 1, two years later. The mouth responded rapidly to treatment and has been maintained in this condition for three years. Right: Same patient, two years later. Although the tongue is practically normal in appearance, the patient occasionally complains of slight glossodynia, particularly at times of emotional stress

3. Factors interfering with absorption:

Gastrointestinal diseases associated with diarrhea and intestinal hypermotility.

Achlorhydria; diseases of the bile ducts; vitamin deficiency (D deficiency interfering with absorption of calcium); and therapeutic procedures involving use of mineral oil, colloidal adsorbents, and strong cathartics (Fig. 3).

4. Factors interfering with utilization:

Liver dysfunction; hypothyroidism; cancer and other malignant diseases of the intestinal tract; and therapeutic procedures such as radiation therapy and the prolonged use of antibiotics which can alter the ecology of the intestinal flora.

5. Factors increasing excretion:

Increased urination occurring in diabetes mellitus and insipidus; lactation; excessive perspiration; and therapeutic procedures involving prolonged forcing of fluid intake.

6. Factors increasing destruction:

Achlorhydria; some types of drug poisoning; and therapeutic procedures involving the prolonged use of alkalis, sulfonamides and arsenicals.

The speed or velocity of the inadequacy state must be considered before rational therapy can be instituted. There are two extremes of velocity of nutritional inadequacy, acute and chronic. Acute lesions are rapid in development, rapid in progress, and if adequately treated, rapid in response to therapy. Chronic lesions are slow in development, slow in progress, and even with adequate therapy, slow in recession—in fact they may be irreversible. Between these two extremes are many intermediate ones, often designated by the term subacute. It must be remembered that an acute episode can be superimposed on a chronic base. Treatment in this case will cause a remission of the acute symptoms, but the case has not been completely treated. The chronic state can still exist, with a lower threshold for another acute episode. These theoretical considerations are extremely important in the practical clinical management of the case. If an acute episode responds to therapy in a short period of time, it may leave a chronic nutritional inadequacy state untreated, so that recurrences of an acute or subacute nature can occur. This may be the basis for some cases of recurrent ulcerative necrotizing gingivitis or so-called Vincent's infection (Fig. 4).

CLINICAL EVALUATION

How can these theoretical concepts be applied clinically? It must be emphasized that deficiencies of single nutritional elements are seldom seen except under experimental conditions. Nutritional deficiencies are usually multiple in nature, although symptoms of inadequacy of one element may predominate. When a patient is examined by a dentist the presence of certain findings should make the examiner suspicious of nutritional etiological factors, and should lead him to further investigation. These findings may be briefly enumerated as follows:

1. Rampant caries. Extensive carious involvement of the proximal surfaces; widespread gingival third cavities or areas of chalky decalcification; recurrent caries around proximal and cervical fillings, particularly when the caries extends from labial or lingual areas to the proximal areas.

2. Lips. (*a*) Fissuring of the vermilion border, with these fissures extending to the adjacent skin. This may be simple chapping due to cold weather, but when the patient states that his lips chap in the summer time, nutritional inadequacy may well be a factor (Fig. 5, above).

(*b*) Cheilosis or angular stomatitis, which is fissuring, inflammation or honey-colored crusting at the angle of the mouth which may be bilateral (Fig. 5, above).

3. Tongue. (*a*) Hypertrophy of the fungiform papillae on the dorsum, tip or sides of the tongue, seen as red dots on the tongue (Fig. 5, below).

(*b*) Fusion of the papillae of the dorsum of the tongue. This can best be demonstrated by rolling a wooden applicator stick over the dorsum of the tongue. In the normal tongue, the papillae are compressed and spring up as the stick is rolled past. In areas of fusion, several papillae will be compressed, and then the whole group will spring up together (Fig. 1, right).

(*c*) Atrophy of papillae, seen as small bald areas, which may be shiny in appearance (Fig. 1, right).

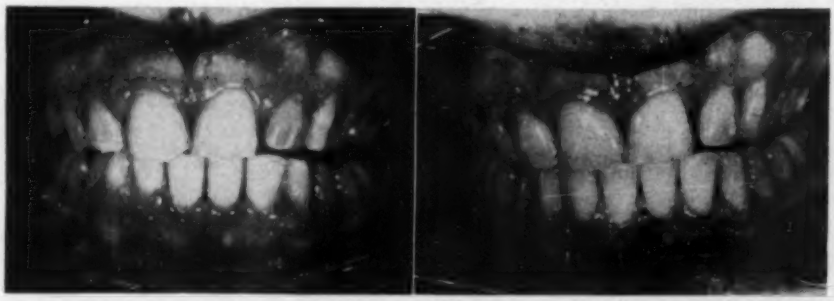

Fig. 3 • Left: White female, 20 years of age, with secondary nutritional inadequacy. This patient had had chronic marginal gingivitis for over a year in spite of repeated dental treatment. The history disclosed that the patient had been taking one tablespoonful of mineral oil twice daily for the past 10 years. She also complained that her hair was dry, her nails broke easily and she observed black-and-blue marks on her skin on the slightest bruise. The mineral oil prevented the body absorption of fat soluble vitamins A, D, E and K. In addition to cessation of mineral oil intake, a balanced diet was prescribed. Routine periodontal treatment, including gingivoplasty in the lower anterior region, was performed. Right: Same patient as at the left, 14 months later. The mouth has been maintained in this condition for two and a half years to date

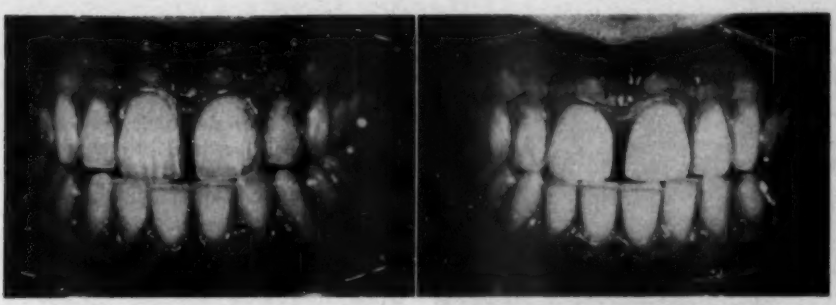

Fig. 4 • Left: White female college student, 19 years old, with primary nutritional inadequacy. This patient exhibited a recurrent subacute ulcerative necrotizing gingivitis which occurred around the time of final examinations. At these times, her dietary intake changed from a well-balanced intake to occasional coffee and doughnuts. Thorough conservative periodontal treatment was instituted and a preventive supplement was prescribed to be taken during examination periods. Right: Same patient as at the left, six months later. The mouth has been maintained in this manner for two years to date

(*d*) A burning sensation or pain may or may not be present.

4. Nose. Reddening and cracking of the skin, at the junction of the alae of the nose and the cheek.

5. Eyelids. A scaly type of eyelid inflammation and increased vascularity of the cornea may be based on nutritional inadequacy.

When the dentist sees one or more of these signs, with or without the presence of generalized gingivitis or periodontal disease, it is important to inquire further into the nutritional background of the patient. This is done by taking a careful medical history to determine the presence of conditioning factors as has been described. This history should include the types of medical therapy the patient is receiving. In addition, a listing of the dietary intake over a period of one week should be supplied between the first and second visits. This consists of obtaining a menu of all foods, candy, water, medicines—everything taken into the mouth. This is listed for each day and for each meal, with approximate amounts of each food. The types of food should also be specified, such as white, rye or whole wheat bread; the constituents of salads; raw or cooked vegetables. This menu should be typical of the individual's diet, and not what he thinks the dentist wants him to eat. The examiner should ask pointed questions, such as: "Have you eaten these foods, or is this merely what was served to you?" "Is this a listing of the foods you usually eat, or was this a special week during which you ate foods different from those you usually eat?" and "Is there any particular reason why you do not eat such and such food?" A great deal of information can be obtained about the patient in this manner.

There are many ways of analyzing these dietary listings, but general impressions are the most that can be obtained from such an unsupervised food menu. The dentist should watch particularly for the following:

1. Excessive amounts of refined carbohydrates; white bread, candy, soda pop, spaghetti, macaroni, puddings and sweetened desserts. By excessive amounts is meant the inclusion of one or more of these items at two or more meals a day, or between meal snacks.

2. Lowered intake of citrus fruits, to-

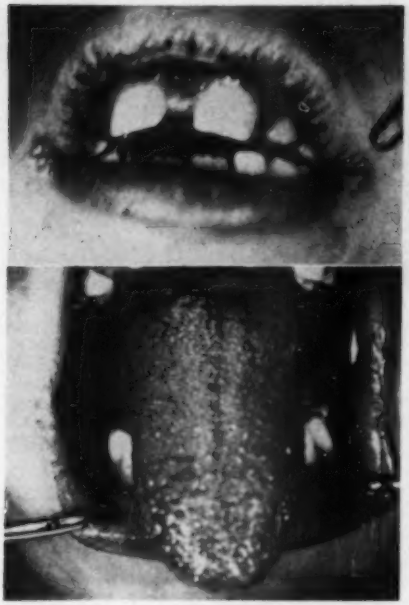

Fig. 5 • Above: Clinic patient, female, 8 years old, with multiple primary nutritional inadequacy. Typical lip lesions (cracking of vermilion border and cheilosis) characteristic of B complex deficiency, particularly ariboflavinosis, are shown. Below: Same patient as above, showing hypertrophy of fungiform papillae of tongue associated with B complex deficiency, particularly aniacinosis. (Courtesy of Pedodontic Clinic, New York University College of Dentistry)

matoes or cabbage, particularly important when generalized gingival inflammation is present, and when there is a history of easy bruising and formation of black and blue marks on the skin.

3. Lowered intake or absence of milk or milk products, eggs, liver, whole wheat products—particularly important when lesions of tongue, lips or skin of nose or eyelids are present.

4. Predominance of soft, nondetergent foods, which is not uncommonly seen in patients with vague or undiagnosed gastrointestinal complaints.

NUTRITIONAL THERAPEUTICS

Gross dietary imbalance of this sort, coupled with clinical findings which may be associated with nutritional imbalance, should prompt the dentist to make every effort to correct the patient's diet. This brings up the question of whether the dentist should assume this role. This question is actually part of a larger one involving the right of a dentist to prescribe medication for his patients—a question which is often asked by students in courses in pharmacology and therapeutics. It can best be answered by the statement that a dentist can prescribe for anything which can be justified as being part of his treatment of oral disease, providing that he is able to treat this condition by virtue of his training and capabilities. The correction of the diet of a patient exhibiting oral lesions associated with nutritional imbalance, is part of a dentist's function. It behooves the dentist to fully understand the condition before prescribing for it. It must be stressed, however, that the dentist should not interfere with any therapeutic diet prescribed by the patient's physician. If it is felt that such a therapeutic diet is producing or is capable of producing oral lesions, the physician should be informed of this, with suggestions made on the correction of these factors. Usually physicians are very cooperative.

The simplest approach to a well balanced diet is by the use of the Basic Seven Food Chart.[14] In this food chart, which can be obtained gratis from the Federal government, it is important to delete the section on energy foods. Experience has shown that patients often prefer these so-called energy foods, which are nutritionally poor, to the exclusion of other more important foods. This is true of patients who consume large

14. National food guide, Bureau of Human Nutrition and Home Economics, Washington, D. C., U. S. Department of Agriculture, (Aug.) 1946.

amounts of refined carbohydrates and sugars. In such a case, inadequacy of other nutrients often results as well as a predisposition to dental caries. The Basic Seven Food Chart, when explained to the patient, will be of great help in obtaining a well-balanced diet.

Unfortunately, the correction of the dietary intake is not always the only thing that has to be done, although, in the absence of certain conditioning factors, it should precede all else. In some instances the patient is not in a position to obtain a sufficient diversity of foods to allow for a well-balanced diet. This can occur when the patient eats most of his meals away from home, either in second rate restaurants or in those educational or other institutions where the authorities appear more interested in saving money than in providing proper diets. In such instances, it is important to stress, once again, the importance of a balanced diet, and to provide a supplement containing the nutritional elements most often lacking in these cases. Such preventive supplementation can also be used when conditioning factors exist, provided that these factors readily permit ingestion of such supplements. This should take the form of one polyvitamin capsule per day, with each capsule containing:[15]

		Approximate daily requirement
Vitamin A	5,000-10,000 I.U.	(5,000)
Vitamin D	400- 1,000 I.U.	(400)
Thiamin hydrochloride	1.5-3 mg.	(1.5)
Riboflavin	2-3 mg.	(1.8)
Niacinamide	15-50 mg.	(15)
Ascorbic acid	50-100 mg.	(75)

The variation in dosage presented here will allow for variation in the needs of each particular patient. With all the different vitamin capsules on the market today, the dentist can readily find one or more which can be used as a preventive supplement by using this dosage pattern as a guide.

If after studying the patient carefully, the dentist feels that a definite nutritional inadequacy exists which is playing an etiological role in the patient's periodontal condition, the therapeutic use of supplements may be indicated. This does not consist of merely telling the patient to take vitamins. The most important factor is the establishment of a well-balanced diet. When symptoms of nutritional inadequacy are present there is usually a multiple deficiency with symptoms of one deficiency being most prominent. It is therefore important to prescribe therapeutic dosages of all the essential vitamins. A therapeutic formula recommended by Jolliffe[15] is as follows:

Vitamin A	25,000 I.U.
Vitamin D	1,000 I.U.
Thiamin	5 mg.
Riboflavin	5 mg.
Niacinamide	150 mg.
Ascorbic acid	150 mg.

A few years ago it was necessary to write a prescription and the pharmacist was asked to compound capsules containing these elements. Today, there are many such therapeutic polyvitamin capsules on the market. It is actually cheaper and simpler to prescribe one of them, providing it contains approximately these amounts of the various factors desired. It is advisable to become familiar with the formula of one such therapeutic polyvitamin capsule, rather than to try to know the ingredients of all the available types. The inclusion of yeast and liver extract in the formula is also advisable. If this cannot be obtained readily, it may be better to prescribe a formula containing therapeutic amounts of the B complex only, plus yeast and liver extract.

15. Jolliffe, N.; Tisdall, F. F., and Cannon, P. R. Clinical nutrition. New York, Paul B. Hoeber, 1950.

These therapeutic formulas should be administered twice a day after meals for about two weeks, then once a day for at least a month or two. To this basic therapy, additional amounts of the specific nutrients needed, as indicated by the symptoms present, should be added. Thus, depending on the patient, roughly 5 to 15 times the daily requirement of that element should be given daily, in divided doses, after meals. In acute deficiencies, the higher dosage should be given for a week or two, while in chronic states the lower dosage should be given daily, in divided doses, for several months. Every dentist interested in periodontia and oral medicine should be familiar with the recommended daily dietary allowances of the Food and Nutrition Board of the National Research Council, as revised in 1948. These recommendations are the basis of most diets and therapy regimens, and can be found conveniently in *Accepted Dental Remedies*[16] published by the Council on Dental Therapeutics of the American Dental Association.

Nutritional inadequacy can exist for other food elements such as iron and calcium. When these are based on a lowered dietary intake, dietary correction is indicated. Where conditioning factors are responsible, the dentist should confer directly with the patient's physician. This is quite important, and some conditioning factors can be considered as a contraindication for therapy by the dentist. In some patients with gastrointestinal disease, for example, the pharmaceutical preparation employed may produce gastric distress, so that it would be best to confer with the physician before prescribing such therapeutic supplements.

It must be repeatedly stressed that vitamin therapy without dietary adjustment is not only poor therapeutics but may prove harmful to the patient. Not all the essential nutrients have been isolated chemically, so that reliance on pills or capsules to the detriment of dietary intake, can prove harmful. A balanced diet will also contain proteins and minerals which the vitamin dispenser so often completely disregards.

CONCLUSION

Just as some dentists have ignored the nutritional aspects of periodontal therapeutics, physicians and nutritionists have too often passed over all local factors and have attempted to treat periodontal disease by prescribing the B complex group or C by mouth or even by injection. Both of these approaches are equally at fault. It is a rather uncommon occurrence to find periodontal lesions in patients without accompanying local causes, but many cases of periodontal disease can have no nutritional basis at all. The dentist must therefore apply all his knowledge and skill to removing all local causes of the condition and in addition apply the principles outlined for the correction of nutritional inadequacies when they exist.

225 West State Street

16. Council on Dental Therapeutics. Accepted dental remedies, ed. 16. Chicago, American Dental Association, 1951, p. 157-159.

Reading • Reading, after a certain age, diverts the mind too much from its creative pursuits. Any man who reads too much and uses his own brain too little falls into lazy habits of thinking. *Albert Einstein.*

Mission to Japan: report to Medical Section, Public Health and Welfare Division, GHQ, SCAP

Pursuant to an invitation extended by the Supreme Commander for the Allied Powers, a committee of five members of the Association visited Japan last July to study all aspects of dentistry in that country and to report their findings and recommendations for improvement of dental services for the Japanese people to the War Department. Members of the Japanese Mission, authorized by the Board of Trustees March 1951, were Harold W. Oppice, president; LeRoy M. Ennis, president-elect; R. C. Dalgleish, trustee from the Thirteenth District; Stanley D. Tylman, chairman of the Council on International Relations, and George C. Paffenbarger, research associate at the National Bureau of Standards. The final report of the Mission was submitted to the commanding officer of the Medical Section, Public Health and Welfare Division, General Heaquarters Supreme Commander, Allied Powers, on August 13, 1951. The observations and comments give American dentists some understanding of the difficulties encountered by dental educators and practitioners in Japan since the beginning of World War II.

REPORT OF THE MISSION TO JAPAN

The Mission recognizes that a 30 day visit to any foreign country is inadequate for the purpose of analyzing the efficiency of its dental organizations, its methods of dental education and the procedures used in dental practice, and in addition to impart information on all phases of American dentistry to the members of its dental profession. Language differences have not made the assignment easier. Much contradictory and confusing information was received. Regardless of these handicaps it is believed that the Mission has attained the objectives presented by SCAP in the original invitation of Brigadier General Sams.

In the survey of Japanese dentistry by the Mission, the tremendous handicaps the Japanese dentist has had to bear were constantly in mind. From the late 1930's through 1945 Japan had a war economy; dental education was geared to this war level; materials and equipment were scarce and of inferior quality; and there was widespread destruction of homes, offices and dental colleges. Yet in the face of such obstacles, in a period of five years the schools have been rehabilitated and re-equipped; practices have been restored; professional organizations have been instituted; periodicals are in press—all of which shows an astounding ability

to recreate a professional life and service. And what is more impressive, the Japanese dentist is far from satisfied by these almost unbelievable achievements. He is determined to better dental health service in every way possible.

Much of the foregoing progress was planned and directed by the Public Health and Welfare Division of SCAP. These men and women who served in this division have erected a monument in Japan to dental health which is indeed creditable.

The Mission has had the pleasure of working principally with three members of the staff of the Public Health and Welfare Division of SCAP; Colonel Mollahan, Dr. Manitoff and Mr. Pollock and with Colonel Ott, the senior dental officer of GHQ, SCAP. Their gracious and willing assistance in all phases of the Mission's work made the assignment a pleasure and not a task.

The members of the Mission will long remember the sterling character, the technical competence and the personal friendliness of Mr. Yuichi Saito who served as the Mission's official interpreter. The Mission acknowledges the many courtesies and cooperation extended to it by the members of the Japan Dental Association.

DENTAL EDUCATION

Predental Education • Predental education should be obtained in any recognized institution of higher learning rather than in a privately or governmentally operated dental college. In all cases credits given for any such training should be acceptable toward a baccalaureate degree. In other words, there should be an opportunity for a free interchange of students among institutions of higher learning. It seems economically unsound for each dental school to maintain the predental curriculum on a satisfactory university level.

It is recommended that such changes in the present system of predental education be effected as soon as practicable.

University Affiliations • Every college of dentistry should be made an integral part of a recognized university as soon as possible. The dental school or dental college in the university organization should have the same academic status as that of other colleges in the university because dental education is relatively as important to human welfare as any other phase of education.

Autonomy of Dental Education • Dental education should be autonomous and therefore should not be under the supervision of any other profession. The dean of a dental school should be required to have an earned dental degree. History has shown that wherever dentistry has been autonomous it has reached the highest pinnacle of scientific development and wherever the reverse has been true, dental health service has been inferior.

The director of the dental clinic in a medical school should be a dentist and not a physician who at present is usually the director. A physician does not have the necessary training and experience to head such a clinic. Therefore, it is recommended that dental clinics in medical schools be directed by dentists. Services in such clinics should be rendered by graduate dentists as an interne or fellow for a period not exceeding three years.

Curricula • The theoretical phase of the curricula in the various schools appears adequate. Laboratory and clinical requirements in the technical phase of dentistry appear to be insufficient. In other words, there seems to be a wide gap between theory and practice in the teaching of dentistry; the interpretation of biological laws in their clinical application appears to be lacking.

Very little, if any, attention has been given to the teaching of pedodontics. This should be corrected at the earliest possible date.

There seems to be little or no teaching of oral diagnosis. There also appears to be no utilization of the departments of roentgenology and pathology in this field. It is recommended that a department of oral diagnosis be established as a part of the curricula in each school.

In the roentgenology departments in all schools an utter disregard for the protection of personnel from roentgen rays was apparent. It is recommended, therefore, that this situation be corrected at once.

What meager opportunity the Mission had to observe clinical operations leads it to believe that greater emphasis should be placed on the teaching of all technical phases of dentistry. In other words, a greater number of practical operations should be performed in the clinic by each student under supervision of a qualified teacher.

Some of this lack of coordination may be due to an incongruous situation in which a person trained in pathology or physiology, for example, may be elevated to head the department of operative or prosthetic dentistry for which he is inexperienced and untrained. Therefore, it is recommended that the teaching of the basic science subjects and the dental technical subjects be better coordinated.

Physical Plant • Many of the schools lack the necessary laboratory equipment to perform the technical procedures satisfactorily. The chairs and other equipment in clinics appear to be satisfactory although antiquated in some institutions and need replacement.

Dental Libraries • The libraries visited are lacking in recently published books and periodicals on dentistry.

Clinical Observation • Students appear to lack burs, stones and hand instruments of sufficient quality and quantity to perform satisfactory operations. The lighting at the operating chairs was inadequate in most instances.

The work on patients showed lack of fundamental knowledge with reference to proper clinical procedures. Apparently there is an inadequate system of clinical records for either administrative or student guidance.

The general practice of using metal crowns on anterior teeth is not only incompatible with the supporting tissues of the teeth but is contrary to good esthetics. It is recommended that the dental profession and schools discourage the use of this type of restoration.

Selection of Teachers • The Mission was informed by reliable sources that the faculty of any given dental school is composed of teachers who are graduates of that institution. This custom produces an inbreeding in teachers which is harmful to educational progress. It is recommended that teachers should be selected on the basis of their ability rather than on the institution from which they graduated.

Financing of Dental Education • Dental education should be financed from at least five sources: (1) undergraduate tuition fees; (2) postgraduate tuition fees; (3) clinical fees; (4) voluntary contributions; (5) Government subsidies.

It is understood that only the first four sources are available to a nongovernmental school. The continuation of such a practice will eventually cause nongovernmental schools to go out of existence or operate at best at a disadvantage in competition with Government supported schools.

In view of the reported low economic status of the average Japanese family, exceptionally qualified applicants to dental schools, who are unable to finance the tuition fees, should be considered for a Government subsidy. The subsidized student should be free to select the school of his choice. This recommendation seems to be in accordance with the present Japan Scholarship Law.

Schools for Dental Hygienists • The Dental Hygienist Law of 1948 appears to be a good one. Consideration should be given to the continued operation of schools for the training of dental hygienists as provided in the July 1948 Dental Hygienist Law. The discontinuance of training such ancillary personnel would be a backward rather than a forward step.

Postgraduate Courses • The lack of organized courses for postgraduate instruction has been noticed. The purpose of these courses is to keep the dentists abreast of recent advances in dental science. Such continued education should be provided under the auspices of a recognized dental school or dental society. These courses should not lead to a graduate degree or be credited toward a higher degree.

Council on Dental Education • It is suggested that the Council on Dental Education maintain a closer relationship with the Ministry of Education in order to elevate further the standards of dental education and dental practice.

Research in Dental Schools • Most of the dental schools have appropriate facilities and equipment with competent staffs to conduct research in dentistry. The research appears somewhat ineffective because little, if any, attempt is made to apply it. This can be corrected if the research personnel and the clinical staff coordinate their efforts to effect a more practical application of the research.

DENTAL MATERIALS AND EQUIPMENT

Japanese dentists have repeatedly expressed their dissatisfaction with the quality of dental materials and equipment manufactured by Japanese firms as compared to that produced in the United States. Some Japanese dentists have been able to obtain "State-side" dental materials in sufficient amounts to make a gross performance comparison. This general consensus of opinion is verified by dentists of the military forces who have had occasion to use materials and equipment of Japanese manufacture.

Visits to three of the larger and more important dental manufacturing firms revealed reasonably good production control laboratories and some means of conducting research. Those firms have the potentialities to produce first class materials. It is not exactly clear, on a casual inspection, why they seemingly do not. Perhaps they do not have the technical competence necessary. Standards and specifications for dental materials established in the United States may serve as a suitable guide for the Japanese concerns.

Additional equipment is needed to test Japanese materials for compliance with specifications of the American Dental Association and with U. S. Government specifications for dental materials.

The establishment of a testing laboratory for dental materials at the National Hygienic Laboratory is an excellent move to better dental materials and to provide an unbiased laboratory to advise the Japanese dentist. There should be the closest cooperation and assistance between this laboratory and the Japan Dental Association.

The Mission has had no opportunity to test or to use Japanese dental materials and equipment and therefore cannot make a substantiated statement relating to their quality.

An extension of credit at a low rate of interest for the purchase of equipment by the Japanese dentist is needed so that he may equip his office properly. This recommendation applies especially to dentists whose equipment was destroyed during the war and to recent graduates. Such extension of credit should be given either by dental manufacturers, banks, private finance companies or the Government.

PUBLIC DENTAL HEALTH AND WELFARE

Postwar progress has been noted in the organization and operation of public dental health programs.

The establishment and operation of 721 health centers and 5,000 hospital units where an enormous amount of outpatient service is rendered show a desire to provide dental health care to the population. However, there appears to be no clear delineation of eligibility for such service. The offering of this service seems to be inconsistent with the provisions of the Social Insurance System under which the same service is provided or intended to be provided through the facilities of private dental practice. Such clinical service in health centers and hospitals, with the exception of providing care for the indigent, is inconsistent with the democratic concept that individuals or their families should provide for themselves.

Health center, school, and hospital clinical service should not be competitive with the private practice of dentistry.

Substantial progress in dental health education has been made in the last four years. The Ministry of Education has been motivated to create dental health awareness. An aggressive but incomplete program of lay education was observed. It appears that this effort is depreciated, however, by the lack of provision for the adequate training of dentists in technical procedures for children. An important step in providing dental health care for children is the conditioning of the profession to render such services when called upon to do so. Such dental health education should start with the dentist. The Council on Dental Health and the Ministries of Education and Health working cooperatively can do much to improve some of the foregoing conditions so evident to the Mission.

The characteristic appearance of adults who display metallic restorations is unsightly. The need for this type of restoration is questionable.

The total lack of properly constituted Departments of Pedodontics is additional evidence of the need for professional education to develop a concept of dentistry as a health service both preventive and protective in nature. A complete dental health service for children offers the best opportunity for accomplishment in prevention.

It is pleasing to note considerable interest in fluoridation of community water supplies and the near accomplishment of fluoridation in certain areas as a caries control measure in the public interest. Such community financed and operated programs demonstrate the most economic, practical and democratic approach to the administration of public health for and by the people.

Liaison of the profession with the Ministries of Health and Education appears to be good but may be improved by wholehearted cooperative effort. The dental profession should provide factual dental health information to school authorities who should adapt such information to the various educational levels. This material should then be reviewed by an approved qualified representative of the dental profession before dissemination to the public.

JAPAN DENTAL ASSOCIATION

Constitution and Bylaws • Generally speaking the Constitution and Bylaws of the Association is a democratic document consisting of rules and regulations that are adequate for the successful operation of the organization. Attention is called to a few sections that might well be changed.

The provision in Chapter II, Article 7, of the Constitution states that applicants for membership shall be subjected to the approval of the Japan Dental Association. Such authority for approval should be delegated to the local association as

it is in a better position to determine the applicant's qualification for membership.

Chapter III, Article 18, of the Constitution provides for elected auditors as officers of the Association. This is not a good policy insofar as the duties of an auditor are generally understood. The auditing of Association accounts and the invoicing of Association properties should be delegated by the Board of Directors to a firm of qualified public accountants rather than to members of the Association.

Article 3 of the Bylaws provides that prefectural dental societies shall collect membership dues for the Association as well as their own. It would be a better policy for the local society to have authority to collect membership dues for all three levels of the Association, namely, the local society, prefectural society and the Japan Dental Association.

Article 11 states that the chairmen of all councils shall be nominated by the president of the Association. It would be more democratic to assign this duty to the Board of Directors rather than to the president.

Article 34 provides that nonmembers of the Association who desire to attend conferences or scientific lecture sessions may be invited as temporary members. It is believed such permission should not be granted as it will tend to decrease one of the incentives for membership. If this provision is intended to permit guests other than dentists who are interested in attending scientific sessions, it is desirable and should be so stated.

It is uncertain from the wording of Article 12 as to who designates the members of the various councils. Again it would be more democratic if such designation was made by the Board of Directors subject to approval by the House of Delegates. The chairman of each council should be appointed by the Board of Directors from among the duly appointed members of such council.

The function of the block representative delegates is not clear. Therefore Articles 5, 6, and 7 are confusing. This should be corrected.

The Japan Dental Association is functioning sufficiently well to recommend continuance of its operation under its present Constitution and Bylaws with minor changes.

SOCIAL INSURANCE PROGRAM

The Japanese dentists complained repeatedly that their remuneration received under the present health insurance system is inadequate to provide a standard of living they should be accorded as members of a profession. They pointed out that the monthly fees they could earn under such a system were approximately 50 per cent of the monthly fees a physician could earn under the same system. Such discrimination is very unfair and should be corrected. It was further pointed out that a new formula had been proposed which was intended to aid this situation. This formula contains an item which takes into consideration the length of time a dentist has been in practice. The length of time a professional man has been practicing should not be used as a criterion for determining the fee to be received. In other words, time in practice is no guarantee of greater proficiency.

An additional apparent inequity in the Japan system relates to the inability of a patient to receive a better service than that provided under the system unless he pays for its entire cost. Provision should be made for applying the fee allowed under the insurance plan as part payment for the more adequate type of dental service.

RECOMMENDATIONS TO SCAP

Advances in Japanese dentistry since the war came about largely as a result of a thorough study of conditions and subsequent recommendations by the dental

officer, Colonel Ridgley, assigned to Public Health and Welfare Division of SCAP. Because no replacement was furnished when Colonel Ridgley was assigned elsewhere, progress was retarded. It is, therefore, urgently recommended that a dental officer be assigned to Public Health and Welfare even though the existence of the agency may only be for a few months. The counsel and advice of such an officer are continually needed by SCAP, the Japanese dentists, and the Ministries of Health, Education, and Welfare and other Governmental authorities.

When educators and technical experts are sent from the United States to Japan and from Japan to the United States there should always be a fair proportion of dental educators and experts. Such has not been done previously.

Fauchard on Sugar • Confections, dragees and all sugars contribute in no slight measure to the destruction of the teeth because by their glutinous nature they penetrate the gums and adhere to the teeth and there is in sugar a penetrating acid which corrodes them, as chemical analysis shows, it causes trouble sooner or later. It may be remarked that those who indulge in these seductive poisons are subject to disease of the teeth and lose them sooner than others. Those who love sugar and eat it often rarely have good teeth or only have teeth of a mediocre quality. Therefore it is necessary after eating sugar to wash out the mouth with tepid water in order to dissolve and carry away that which may be left behind in the mouth. I do not mean by what I have just said that it is necessary to abstain absolutely from these things which I have noted as bad for the teeth, if the use of them is regulated and not made a habit which experience teaches is prejudicial. *Pierre Fauchard, The Surgeon Dentist, 1746 (Mrs. Lindsay's translation, p. 24)*

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Editorials

Dental care for cerebral palsied children

The cerebral palsied child probably is the most difficult type of patient with whom the dentist must deal. Seven out of every 100,000 newborn children, it is reported,[1] suffer from this condition. One dies early, two are placed in institutions, one is but slightly handicapped and one is bedridden, leaving two who are severely crippled and whose dental condition must be cared for in the office of the private dental practitioner. It is estimated[2] that there are approximately 130,000 children of school age suffering from cerebral palsy in the United States today.

Approximately 85 per cent of the cerebral palsied patients are classified either as spastics or athetoids. Their lack of muscular control is the result of brain lesions caused by birth injuries or prenatal cerebral defects. Contrary to former common opinion[3] few cerebral palsied patients are mentally defective. On the contrary, most are normal and some are brilliant. Dentists having such children for patients should realize that their impairment is functional rather than mental.

In the aggregate, the number of cerebral palsied children is not large and their dental condition no better or worse than that of the average child. However, their unfortunate physical condition, plus the fact that many are highly emotional and uncooperative, makes them extremely difficult patients; so difficult that some dentists decline to accept them. This attitude, although partially understandable, is wholly deplorable. The spastic or athetoid child, already heavily handicapped by his physical condition, should not be handicapped further by untreated dental disorders.

Until recent years the principal adjuncts of the dentist in treating the cerebral palsied child were patience, perseverance and understanding. These attributes, coupled with extreme digital dexterity, frequent examinations and prophylaxis, enabled

the dentist to maintain the mouths of his few spastic patients in a fairly hygienic condition. These resources, however, did not permit him to furnish such patients with extensive dental restorations even though they were badly needed.

Recently, a comparatively new drug, Mephenesin, reportedly has been used effectively as a premedicant for cerebral palsied dental patients. Manuel M. Album[1] of the Philadelphia Society for Crippled Children and Adults, who employed this form of premedication for 35 patients, reports that when administered in elixir form 15 to 30 minutes prior to the operation, Mephenesin depresses abnormal activity of skeletal muscles and lessens anxiety tensions. The feeling of euphoria which it produces disappears within the hour, leaving no ill after effects.

It is hoped that further study on the use of Mephenesin will substantiate these observations. If so, the use of the drug will become a boon to both patient and dentist. In the meantime, more children with cerebral palsy are being born each year and more will require dental attention. Although administering to these unfortunate children is nerve racking, time consuming and seldom satisfactory, no dentist worthy of his professional calling can fail to serve them.

1. Album, Manuel M. The dental use of Mephenesin for cerebral palsied patients. To be published in J.A.D.A.
2. National Society for Crippled Children and Adults, Inc.
3. Leonard, Richard C. Dentistry for the cerebral palsied. J.A.D.A. 41:152 (Aug.) 1950.

The nineteen fifty-one Relief Seal campaign: low sights never hit high targets

No dentist with a spark of imagination can help but realize the potentials of the Association's Relief Fund program financed by voluntary contributions—a program designed to aid impoverished dentists. Each year at this time members receive a small packet of Relief Fund Seals and a reminder to participate in the program. This year the seals were mailed late in October. Members are urged not to discard them but to acknowledge their receipt by placing a sizeable check in the self-addressed envelope provided for that purpose. Contributions to the Association's Relief Fund[2] last year totaled $91,404, some $8,000 less than the $100,000 anticipated by the Council. Half of that amount, less a proportionate share of operating expenses, was returned to the constituent dental societies. The remainder, less expenses of the Council on Relief, was deposited in the American Dental Relief Fund, which now amounts to $679,747. Only the income from this Fund can be expended—and then only for relief purposes. Last year interest and dividends from the Fund amounted to about $27,000. During

that same period the Association's share of relief grants provided 70 recipients was approximately $52,000. Thus the income from the Fund fell some $25,000 short of meeting relief grants. Fortunately prior to 1948 the Relief Fund had accumulated an unexpended reserve of $168,000, available for grants. Last year's $25,000 deficit plus deficits in 1949 and 1950 reduced the reserves available for payment of grants to $108,000. Obviously, the reserve will be depleted within a few years unless the relief grants are drastically reduced or annual contributions are greatly increased. The former alternative must not happen. The latter should.

The Council on Relief has done an outstanding job of revitalizing the Relief Seal campaign and in reorganizing the relief program. However, it has made the mistake of setting its sights too low. One hundred thousand dollars, the annual goal set by the Council, is too small to meet existing needs, too meager to compete with spiraling prices and too modest to dignify a program of such worth. Contributions to the 1951 Relief Seal campaign averaged $1.35 per member—less than the cost of a carton of cigarettes and less than the price of a modest meal. More must be done to alert dentists to the worth of the relief program. Once alerted, dentists, never niggardly, will cooperate by raising the average contribution to five or more dollars per year.

The Council on Relief is charged with two responsibilities: (1) to relieve the financial burden of worthy, needy dentists; (2) to build the resources of the Relief Fund to such size that income therefrom will finance sufficiently the Association's share of relief grants. To discharge the latter responsibility the Council requires the cooperation of every active member of the Association. The present resources of the Relief Fund easily can be tripled, without hardship to any dentist, if each contributor doubles or triples his annual donation. In a few short years the income from the Fund then should be sufficient to finance the Association's share of relief grants. Let's raise our sights and shoot for that target!

1. Reports of Officers and Councils, American Dental Association, 92nd annual session, (Oct.) 1951, p. 84.

The use and abuse of statistics

A glance into any dental or related journal will reveal the prominence that statistics occupies today as a means of solving professional problems. In the June issue of the *Journal of Dental Research* at least half of the articles certainly rely on incidence, frequency, means, ratios and other statistical devices to substantiate the conclusions of their authors. The *American Journal of Public Health,* in August, issued a separate number devoted to methods used in research on problems falling within its scope, which consisted almost entirely of statistics.

Yet with all this reliance on figures, measurements and instances, disparaging comments appear from time to time with regard to the validity, sincerity and

significance of the results obtained. In *Harper's Magazine,* last year, the reader was instructed "How to Lie with Statistics," and the skeptical views of the author were echoed in excerpts published in the *Illinois Dental Journal.*

One cannot read intelligently or speak accurately in any language until he has learned its grammar and idiom. It is equally possible to misstate and misunderstand in English, German, French, or Russian. Statistics is only a device for revealing through mathematics—the least equivocal of all languages—the quantitative relations among data submitted to its manipulations. If the data are well chosen, the statistical results will be valid; if the data are badly chosen, the results, though consistent, will be misrepresentative. Likewise, the results of statistical analysis, though sound, may be misapplied. These deviations from truth are not the fault of statistics but the result of some shortcoming in the thinking or aims of the user of statistics.

Some months ago, THE JOURNAL published a statistical study[1] entitled "The Deterioration of Human Teeth." The article was published because the data were uniform, representative and ample, because the mathematical procedures were unquestionable and because the results were valid and valuable. The article demonstrated for large comparable groups of freshman college students that the incidence of caries had increased by increments of about 7 per cent for each 10 year period from 1929 to 1949. With so much to recommend publication, the article was nevertheless open to criticism, and still calls for a word of warning to the unwary reader who may infer that only truth can be built on so sound a foundation of statistical fact.

In the opening lines, the author poses the question, "Is there a force at work, an evolutionary or degenerative force, that is slowly but surely eliminating certain teeth from the human dentition?" And at the close, the article is summarized in these words:

> The present report is not presented in a spirit of pessimism. Even though there does seem to be a trend toward the reduction and deterioration of human teeth, that tendency is not necessarily irreversible. And, even if it cannot be reversed, it may indicate merely that a portion of the human anatomy that is no longer of very much use is on its way to disappearing, like the vermiform appendix at present and the caudal appendage of the past.

Obviously, this insinuation of an evolutionary cause for the demonstrated increase of caries is in nowise suggested or substantiated by the statistical analysis. There is not one iota of evidence presented that bears in any way on the cause of the phenomena, and the evolutionary trend intruded into the conclusions is purely speculative. In fact, judged in the light of general knowledge (not statistics), those great gradual processes of nature that ultimately revolutionize the bodies of living creatures are usually not to be detected in a period of 20 or 30 years, but only through long ages of change. Caries may plague humanity for thousands of years without affecting the perennial impulse to produce tooth germs. For variations in the incidence of such morbidities as caries, the investigator would turn for explanation more rationally to some historical circumstance of a relatively transient character such as the known increased consumption of sugar during the last few decades.

The article discovers some of the most reliable and valuable results to be obtained by statistical methods, for which the author is to be greatly commended. But it also exemplifies one of the commonest misapplications of the results of statistics, a complete non sequitur. Again, let it be said, statistics do not lie, but zeal, illogic, or imagination may lead to the abuse of this useful tool.

1. Brekhus, Peter J. The deterioration of human teeth. J.A.D.A. 42:424 (April) 1951.

COUNCIL ON DENTAL THERAPEUTICS

Council reports on detergents containing hexachlorophene

Detergents containing hexachlorophene have been promoted actively to the dental profession within the last few years.[1,2] The Council on Dental Therapeutics has considered the available evidence and has authorized the publication of the following report as representing the Council's conclusions concerning this type of product.

Consideration of "antibacterial detergents," for routine use by the dentist, involves the entire question of aseptic technic in oral practice.

In view of the fact that under normal conditions the oral cavity harbors a prolific and variegated bacterial flora which exerts no apparent harmful effect on the general health of the individual, the chief concern of the dentist would appear to be the prevention of the entry of foreign pathogenic microorganisms or viral agents to which the patient may not be immune. Greater danger may be anticipated in those operations involving intentional or accidental rupture of the continuity of the epithelium, a procedure which would allow direct access of infective agents to the deeper layers of the mucosa and to the circulation. This danger is readily recognized in all surgical procedures, but the frequent occurrence of epithelial perforation during restorative and periodontal operations should not escape emphasis.

The relatively low incidence of secondary infection following the routine removal of teeth indicates that the defense mechanisms of the blood and the saliva may be relied upon to provide some measure of protection against the native oral microorganisms which enter at the site of extraction. From the standpoint of safety, however, it should be assumed that foreign infectious agents carried by the operator's fingers or instruments may not be neutralized effectively by the aforementioned mechanisms, and precautions should be taken to avoid "cross-infection" insofar as it is possible to do so.

The wearing of the surgical mask and gloves, the use of the rubber dam in restorative procedures, and the prophylactic administration of antibiotics topically or parenterally before periodontal or surgical operations may be expected to reduce the frequency of secondary infections arising from extraneous sources. Proper disinfection of instruments and dressings is an obviously necessary part of technical preparation.

If rational preparatory technics have been carried out, the risk of contamination ultimately appears to reside in the efficacy of the methods used by the operator to free his own fingers from residual pathogens. When sterile rubber gloves are worn, there remains the possibility of contamination through a torn or per-

1. Price, P. B. The meaning of bacteriostasis, bactericidal effect, and rate of disinfection. Ann. New York Acad. Sc. 53:76 (Aug.) 1950.

2. Shay, D. E. A study of the effectiveness of some skin detergents under conditions of use. Oral Surg., Oral Med. & Oral Path. 4:355 (March) 1951.

forated glove. It may be noted that the routine use of gloves is an uncommon practice in dental offices; many practitioners do not wear gloves even during surgical operations.

A brush properly used with a good detergent will remove gross soil from the surface of the hands, but it is well known that significant numbers of residual bacteria can be demonstrated after the usual scrubbing procedure, even when this is followed with an alcohol rinse. The antiseptic solutions which are intended to disinfect instruments are not practicably applicable to disinfection of skin, because of the long exposures required for assurance of destruction of microorganisms. A sterile skin surface cannot be hoped for; the best that can be achieved is maximal reduction of the viable bacterial population on the accessible areas of the skin. To this end, a number of so-called "antibacterial" cleansing agents have been offered to the profession.

The biologically active ingredient of the products considered in this report is hexachlorophene, which has been described in *Accepted Dental Remedies,* ed. 16, page 75. Evidence has appeared which is intended to demonstrate that the use of detergents with added hexachlorophene results in unusually low numbers of residual bacteria on the skin, and that the frequent and exclusive use of these products prevents the reappearance of large numbers of bacteria over a period of several days. The experiments employed the following principles:

1. Operators scrubbed with the test materials and rinsed their hands in measured amounts of sterile water. Suitable dilutions of the rinse-water were then cultivated on liquid or solid media, and the subsequent turbidity or the colony count was determined.

2. Intraperitoneal injections of rinse-water were administered to mice whose resistance to infection had been lowered with mucin, and the potential virulence of the residual skin flora was estimated from the mortality data obtained. In some experiments, the skin was contaminated with a hemolytic streptococcal culture before use of the test materials. In another type of experiment, contaminated areas of the shaved abdomen of mice were washed with the test products, and segments of the treated skin were implanted into the peritoneal cavity along with sterile mucin.[8]

Results were interpreted as indirect expressions of the number or potential virulence of bacteria remaining on the scrubbed skin. Inert preparations were employed in control experiments.[3-8]

Several objective criticisms of the evidence may be pointed out.

1. In most of the bacteriologic tests, significant quantities of hexachlorophene were carried over with the inocula, opening the question of whether substantial numbers of the bacteria actually were destroyed on the skin or whether residual traces of the disinfectant merely inhibited growth in the culture media. In several investigations[5,6] however, the residual hexachlorophene was neutralized with sheep serum in the media.

2. No evidence is presented concerning the identity of the organisms which were removed in the rinse-water or which remained viable on the skin. It is possible that spore-forming bacteria, as well as

3. Nungester, W. J.; Thirlby, R. L., and Vial, A. B. Evaluation of hexachlorophene and detergents as substitutes for the surgical scrub. A biological technique. Surg., Gynec. & Obst. 88:639 (May) 1949.

4. Clark, D. G. C., Lockwood, J. S., and Lewit, Elizabeth. 2,2'-dihydroxy-3,5,6-3', 5'6 hexachlorodiphenyl methane (G-11) as an antiseptic for use in surgical scrubbing. Surgery 22:360 (Aug.) 1947.

5. Fehlberg, W. J.; Swan, J. C., and Seastone, C. V. Studies on the retention of hexachlorophene (G-11) in human skin. J. Bact. 56:323 (Sept.) 1948.

6. Seastone, C. V. Observations on the use of G-11 in the surgical scrub. Surg., Gynec. & Obst. 84:355 (March) 1947.

7. Price, P. B., and Bonnet, Alberta. The antibacterial effects of G-5, G-11, and A-151 with special reference to their use in the production of a germicidal soap. Surgery 24:542 (Sept.) 1948.

8. Seastone, C. V., and Erickson, T. C. A comparison of solid and liquid soap as vehicles for G-11 (hexachlorophene) in surgical wash. Surgery 25:290 (Feb.) 1949.

pathogenic yeasts and viral agents, may be unaffected by the treatment.

3. It has been shown that the inhibitory effect of hexachlorophene upon known test organisms is nullified by the inclusion of blood, serum, ovalbumin, or serum globulin.[6] Hence, the efficiency of hexachlorophene in an area of bleeding or exudation might be diminished considerably. While evidence is lacking, it is possible that saliva, also, may exhibit an inactivating property similar to that shown by the aforenoted substances.

The importance of this feature may be evaluated if it is recalled that the process of inhibition by anti-infective agents appears to be a function of time as well as of concentration. If, before sufficient time has elapsed, bacteria in contact with hexachlorophene are exposed to a neutralizing agent such as serum globulin or albumin, it is possible that the antibacterial action would be nullified and that the virulence of the organisms would be restored. In this manner viable organisms might be implanted in open wounds from the operator's skin, even though cultivation of the rinse-water from the preceding "scrub" might show essentially negative results.

In the opinion of the Council, detergents containg hexachlorophene would appear to be of limited value in ordinary dental practice. There is no indication that they may be harmful in any way either to the dentist or to the patient. Unless he is fully aware of their practical limitations, however, the dentist may derive a false sense of security from their use.

The Council has voted to give consideration to individual products of this type as useful adjuncts to the usual preoperative cleansing procedures employed by oral surgeons. The Council will require that the promotional material for products accepted shall clearly indicate the limitations attendant upon the use of the individual product. Subject to the appearance of new and conclusive evidence, the Council will further require that no claims shall appear which may suggest that routine cleansing procedures may safely be curtailed or otherwise altered when these products are employed.

Council classifies Dr. Halford's hemostatic pads in group D

Dr. Halford's Hemostatic Pads (Halford Laboratories, Fresno, California) (formerly Coago Pads) were the subject of a preliminary comment (*J.A.D.A.* 36:506, June, 1948) in which it was pointed out that no reply had been received to a routine inquiry sent to the manufacturer on August 20, 1947. Letters sent on April 10, 1950 and on August 28, 1950 were not acknowledged.

The label states that the active ingredients are ferric subsulfate and tannic acid. The pads consist of two layers of white fibrous material, apparently absorbent cotton, between which is contained a small quantity of yellowish powder.

The advertising material includes a form letter and several illustrated prescription forms which bear instructions for use of the product. The letter implies that by prescribing the pads the dentist will obviate the necessity for visiting the hemorrhaging patient during the night.

It refers to dentist-druggist relationships, self-treatment by the patient, and suggests the amount of additional fee that should be included in the dentist's charges to the patient.

A leaflet contains instructions for use of the product and states unequivocally that the pad stops postoperative hemorrhage. The label and the descriptive literature bear a warning that this preparation turns black when moist and state that stain may be removed with a hypochlorite solution.

A Council referee arranged for a limited clinical trial of the product in two patients who were scheduled for multiple extraction procedures. In each case Dr. Halford's Hemostatic Pads were applied to one area of postoperative bleeding, and regular sponges were used simultaneously on another area in the same mouth. During one hour of observation there was no evidence to indicate that hemorrhage was reduced more effectively under the test pads than under the control sponges. The report comments: "In Case 1 the entire mucosa was stained black. The bib and patient's face were soiled. The cuspidor and adjacent equipment were splattered with black sputum. This was reduced to a minimum in the second case by frequent changing of sponges to absorb the oral secretions. The oral mucosa appeared to be slightly cauterized around the hemostatic pad." The general appearance of the mouth of one patient after use of the product is shown in a Kodachrome transparency on file in the Council office.

It may be noted that the appearance of the designation "Dr." in the name of the product does not conform to the *Provisions for Acceptance of Products by the Council.*

In consideration of the lack of evidence for the usefulness and safety of the pads in hemostasis, of the objectionable black staining which accompanies their use, and of the nature of the promotional material employed by the manufacturer, the Council has voted to classify this product in Group D.

COUNCIL ON LEGISLATION

1951 state dental legislation

Forty-four state legislatures convened during 1951, but only ten of them enacted important dental laws according to state society reports received by the Council on Legislation. Nine of the ten states amended or added to their laws regulating the practice of dentistry and dental hygiene. These were Colorado, Connecticut, Maine, Nebraska, New Mexico, New Jersey, New York, Texas and Washington. New Mexico and Texas for the first time enacted laws governing practice by dental hygienists. All of the states and the District of Columbia now regulate the practice of dental hygiene under the control of their dental boards. The tenth state, Kansas, passed a law requiring the appointment of a dentist as a member of the State Board of Health. Digests of the new laws follow.

COLORADO

The Colorado Dental Practice Act was amended to include the requirement that a written prescription[1] must accompany an order from the dentist to a dental laboratory. Under the new law a dentist may have his license revoked for engaging the services of a laboratory without a written order or prescription.

CONNECTICUT

The Connecticut Dental Practice Act was amended: (1) to include the injunction remedy[2] as an additional means of enforcing the act against illegal practitioners, (2) to make licensure by reciprocity discretionary with the Connecticut Dental Commission and (3) to add as a cause for revocation of a dentist's license aiding or abetting an unlicensed person to practice dentistry. A bill to strengthen the definition of dental practice in the present law so that it would specify among other operations the reproduction, reconstruction, or repair of dentures was withdrawn when it was determined that the legislature would pass the bill only if the repair operations were excluded.

In addition, the Connecticut Legislature passed a law enabling the Connecticut Medical Service Plan to provide as benefits some of the services performed by dental surgeons.

KANSAS

The law establishing the Kansas Board of Health was amended to require the appointment of a dentist member.

MAINE

The Maine Dental Practice Act was practically rewritten and includes the following important changes:

1. Redefines the practice of dentistry to clarify the scope of technician and dental laboratory operations and includes a provision prohibiting laboratories and technicians from advertising to the public in any manner.

2. Requires both dentists and dental laboratories to retain copies of prescriptions for two years.

1. A list of the states requiring written prescriptions follows the digests.

2. A list of the states authorizing injunctions against unlicensed persons who practice dentistry follows the digests.

3. Prohibits the practice of dentistry by corporations.

4. Authorizes the Board to hire an attorney and professional investigators.

5. Increases the annual renewal fees of dentists and dental hygienists from two to four dollars and one to two dollars respectively, the extra funds to be made available for the investigation and enforcement program.

6. Empowers the Board to apply for injunctions to restrain illegal practice.

7. Authorizes the Board to subpoena witnesses and documents.

8. Specifies that dishonorable conduct shall be a cause for suspension or revocation of a dentist's license and authorizes the Board to define dishonorable conduct under its regulatory powers.

9. Makes advertising by licensed dentists beyond the limits of modest professional announcements and signs a misdemeanor.

10. Prohibits dental hygienists from using patient lists of former employers and makes that practice a cause for suspension or revocation of license.

NEBRASKA

The Nebraska Dental Practice Act was amended to improve and enlarge upon the definition of practice, including the requirement that technician and laboratory operations may be performed only upon the written prescription of a licensed dentist. In addition the law now prohibits any laboratory-public relationship, including advertising.

NEW MEXICO

The New Mexico Dental Practice Act was amended in three respects: (1) to authorize the issuance of special permits to out-of-state licensed dentists to allow them to practice in state institutions, (2) to require that members of the Board of Dental Examiners be appointed from a list of five persons submitted by the New Mexico Dental Society and (3) to limit the dental board's discretion in the granting of licenses under the reciprocity privilege.

New Mexico became the forty-seventh state to enact a law requiring the licensure and regulation of dental hygienists. The law defines and limits the operations of dental hygiene; establishes the qualifications for examination and licensure; and provides for administration and enforcement by the Board of Dental Examiners.

NEW JERSEY

The New Jersey dental and dental hygiene laws were amended: (1) to require dental clinics to obtain a permit from the Board, (2) to allow dental internships and residencies to extend over a period of three years on a yearly renewable permit basis and (3) to authorize the suspension of a hygienist's license for failure to renew it on the annually prescribed date.

NEW YORK

The New York Dental Practice Act was amended: (1) to remove the requirement for registering dental and dental hygiene licenses in the county of practice, (2) to raise the examination fee for dental applicants from $25 to $30, (3) to raise the biennial renewal fees for dentists and hygienists from $4 to $5 and from $2 to $2.50 respectively and (4) to permit New York schools training dental hygienists to accept male students.

TEXAS

Texas became the forty-eighth state to provide by law for the licensure and regulation of dental hygienists. Basically, the law is similar to the New Mexico law, except that it specifically authorizes hygienists to apply sodium fluoride topically.

WASHINGTON

The State of Washington amended its dental laws in four important respects: (1) Adds the written prescription requirement. (2) Increases the renewal fees of dentists from two to five dollars. Three dollars of each renewal fee, plus all unexpended application fees, are to be set aside for investigation of illegal practice and enforcement of the act. (3) Requires that an applicant for a license must hereafter be a citizen of the United States or have his first papers for naturalization. Persons in the latter class must acquire citizenship within six years after obtaining their licenses or lose their right to practice. Presently licensed dentists, however, are not affected. (4) Amends the dental hygiene regulations to permit hospitals to employ dental hygienists to work under the direction and the supervision of licensed dentists. The new law also specifies that dental hygienists may apply medicinal agents for prophylactic purposes.

The following states have laws requiring written prescriptions from dentists to dental laboratories: Arizona, California, Colorado, District of Columbia, Florida, Kansas, Maine, Massachusetts, Minnesota, Nebraska, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Rhode Island, South Dakota, Washington, West Virginia and Wisconsin.

The following states have laws specifically authorizing the dental board to apply for an injunction: Arizona, Arkansas, California, Connecticut, Florida, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Missouri, New Jersey, New Mexico, Oklahoma, Pennsylvania, Tennessee, Texas, Utah, Washington.

Bruce R. Kurtz,
Vice-chairman

Book Reviews

ANATOMY OF THE NERVOUS SYSTEM

By Olaf Larsell, Ph.D., Sc.D. Second edition. 520 pages with 382 illustrations. Index. Price $9. New York, Appleton-Century-Crofts, Inc., 1951.

This second edition of a well known text is in reality a new book. Not only have most of the chapters been rewritten but much has been added and the whole material has been rearranged. The addition of a description, well illustrated, of the gross anatomy of the central nervous system is a happy change. The incorporation of many new findings and experiences of the last 10 years is likewise of great advantage. It seems to this reviewer that it will be most helpful for the graduate student in neuroanatomy or neurology, for the neurologist himself, or even for teachers in these subjects, but it seems doubtful that it is an ideal textbook for the undergraduate level. A. T. Rasmussen, in his introduction, stresses the fact that over-simplification has been avoided by Larsell. Though this is quite correct and praiseworthy, it seems that too little attempt has been made to achieve a sound and, as the reviewer believes, necessary simplification by a careful, selective omission of details. It seems, also, that quite a few of the diagrams are too complicated and not transparent enough to aid the undergraduate student, as for instance the following figures: 146, 148, 151, 152, 208, 209, 269, 270, 337, 348, 361, 374. It is an error to try to explain many things by one and the same diagram. It also seems necessary to use either different colors or differently drawn black lines in order to enable the student to retain a mental picture after following neuronal connections through a maze of crossing and recrossing paths.

On the whole, however, it is an excellent book.

Harry Sicher

WHAT SHALL THE HEART REMEMBER?

By Anderson M. Scruggs. 69 pages. Price $2.50. Athens, Ga., University of Georgia Press, 1951.

When a dentist writes a poem, that is unusual; and when a dentist writes a whole book of poems, that is more unusual; but when a dentist writes three books of poems, that is an event.

However, Anderson M. Scruggs of Atlanta, Georgia, professor of dentistry in Emory University, has to his credit two books of poems, *Glory of Earth* and *Ritual of Myself*, and has recently published *What Shall the Heart Remember?*

Although Dr. Scruggs' poems have appeared in *Saturday Evening Post, Hygeia,* the *New York Times* and many other magazines and newspapers, it is doubtful that many readers have realized that he is a dentist. Seldom are scientists thought of as poets. Dr. Scruggs, however, has proved himself to be not only a poet, but one of the best American poets writing today. He has depth of sentiment, originality of thought and mastery of poetic phrasing and technic, and his manipulation of imagery is fresh and refreshing. He has the rare gift of recalling, through musical overtones of poetic cadence, the reader's intimate memories.

The many sonnets include those on love—such as "What Shall the Heart Remember?" "Soliloquy after Love," "The Lost Days," "First Meeting," "The Perfect Hour"—and a great variety of other themes. There are those on music and musicians—"The First Symphony: Johannes Brahms," with "the wind sweeping the violin strings—now full, now thinned," and Tschaikowsky "who bore his grief on every bar and note." Dr. Scruggs' poems of other types include such intriguing titles as "On Coming across an Old Newspaper in the Woods" and "Problem for Moralists"—

> The Swift forgetfulness of *good,*
> The long sweet memory of *sin.*

Occasionally, Dr. Scruggs blends effectively contrasting themes such as war and peace as in "Monstrous Artifice":

> In machine guns and their prattle
> As they stitch the seams of battle.

In "Battlefield of Beauty" the figure is reversed:

> Where silver, sudden rifles of the rain
> Seek out the soil, and winds in boughs release
> Soft bombs of bloom down silent hills of peace.

Through his writings Dr. Scruggs has done much to change the minds of many of his fellow practitioners who have thought that they did not care for poetry.

Fern Billingsley Denton

RADIOLOGY OF THE TEETH AND JAWS INCLUDING DENTAL RADIOGRAPHY

By Frank L. Ingram, D.M.R.D., L.D.S., M.R.C.S., L.R.D.P. First edition. 160 pages. Index. Price $3.50. Baltimore, Williams & Wilkins Co., 1950.

This interesting book is quite comprehensive, but it is far too brief to successfully fulfill the author's avowed object: "For Students and Practitioners of Dental Surgery and Radiology." Chapter 1, comprising less than six pages, mentions the following topics: nature or x-rays, generation of x-rays, protection and safety measures, films, making an exposure, distance and exposure, processing, the fully processed negative, reduction, mounting. A reference book would most certainly be required to supplement this information if the student of dental surgery is to comprehend the subject to the extent necessary in present-day dental education.

As the title indicates, dental radiography is included, but likewise is too briefly discussed. What information is given indicates that the author himself is well acquainted with the subject, but he falls short in his attempt to convey his knowledge to a student.

The remainder of the book deals with normal radiographic appearances and with pathologic conditions, and utilizes well chosen illustrations, faithfully reproduced by the publisher. This book would be useful to a general radiologist not specifically trained in oral roentgenology, but it is not adequate for students of dentistry.

LeRoy M. Ennis

MASTER YOUR MIND!

By Samuel Kahn, M.D., Ph.D. Second edition. 262 pages. Index. Price $3.00. New York, Rockport Press, Inc., 1951.

There would appear to be no question that this little volume is literally a gold mine for those who are willing to "work" it. As is stated in the introduction, there are some who will consider its philosophy valueless, but such an attitude is more likely the result of failure on the part of the reader rather than on the part of the author.

In a scientific field such as dentistry with its constant advances, the practitioner must of necessity be a student all his life if he is to provide the service that is considered the public's due. This book offers guidance on study methods that can be applied at any level of knowledge.

One of the most unusual chapters, "Interesting Suggestions for Students," presents a novel approach to thinking and learning. Under the four headings of health factors, learning, aspects of mental hygiene, and philosophical thoughts, the author has assembled pertinent axioms, adages, proverbs, and mottos, each with brief illuminating comments that point up their application to our modern daily living. Another chapter presents 46 specific recommendations, each explained and elaborated. There is a chapter on how to use a library, and another on proper utilization of reference materials. In this latter, 62 specific sources of general reference material are listed. In the final chapter 48 questions recommended for self-analysis are listed. There is an extensive general bibliography.

W. W. Bolton

FIRST AID—SURGICAL AND MEDICAL

By Warren H. Cole, M.D., and Charles B. Puestow, M.D. Fourth edition. 432 pages with 196 illustrations. Index. Price $4. New York, Appleton-Century-Crofts, Inc., 1951.

Doctors Cole and Puestow have thoroughly revised the fourth edition of their book. Some of the drugs recommended in former editions have been deleted and newer and more effective ones, primarily the antibiotics, have been included.

In a well-ordered fashion the book covers in detail first aid treatment for injuries likely to be sustained both in civilian life and in war. A considerable portion of the book deals with first aid treatment of atomic blast casualties. The authors have achieved a nice balance in their book. Their material, presented with 196 illustrations, should be readily understandable to any first aid worker. The book also could be read with profit by anyone interested in this service irrespective of his training.

As a basis for the discussion of what to do, how to do it, and what not to do in an emergency, Dr. Puestow has written chapter 3 on anatomy and physiology. This chapter contains only 28 pages and yet it is a remarkably comprehensive résumé of the subject. In addition to the two authors, 19 other prominent physicians have contributed material dealing with their specialties.

In these uncertain times when dentists may well be called upon to play an important part in supplementing the services of physicians in an emergency, a book such as this should have an important place in the library of every dentist.

Warren R. Schram

The ninety-second annual session of the American Dental Association

Washington was the scene of decisions of importance to the dental health of the public and to the dental profession, on October 15-18, when the Association held its ninety-second annual session at the Statler Hotel with an attendance of 10,781.

Adopting an attitude of fairness and caution, the House of Delegates voted to study further the question of the inclusion of dentists in Social Security provisions, and to consider it again at the next annual session. It adopted in principle the purposes of the Local Health Services Act of 1951, but resolved to request more specific definition of its provisions by Congress. Many other decisions were made, designed to protect the public health by aiding the Federal Government and its agencies, as well as the state and local governments, to discharge their responsibilities. Noteworthy throughout the meeting was the emphasis placed on the responsibility of the constituent and local dental societies to maintain vigilance concerning actions by their state and local governments.

Miami won over Atlantic City as the 1954 meeting place, and the dates were set for November 8-11. The 1953 session, to be held in Cleveland September 28-October 1, will have Walter J. Pryor as local arrangements chairman. Henry F. Westhoff is chairman of local arrangements for the 1952 session, to be held in St. Louis September 8-11.

During the meetings, Harold W. Oppice was honored repeatedly for his year of service as president of the Association, and was presented with a gavel made from the original White House wood from the District of Columbia Dental Society, as well as a watch from the Illinois State Dental Society. Harold Hillenbrand, secretary of the Association, received a calendar watch from the five immediate past presidents, as a token of their appreciation of his fine assistance.

ELECTION OF OFFICERS AND TRUSTEES

LeRoy M. Ennis of Philadelphia was installed as president at the close of the meeting, to succeed Harold W. Oppice of Chicago. Otto W. Brandhorst of St. Louis was installed as president-elect. First vice-president is David J. Fitzgibbon of Washington, D. C., chairman of the local arrangements committee for the ninety-second annual session. P. M. Cunningham of Cheyenne, Wyo., is second vice-president; and Brig. Gen. Oscar P. Snyder, director of dental activities at Walter Reed Army Medical Center, is the new third vice-president.

Ernest G. Sloman of San Francisco was elected speaker of the House of Delegates, to succeed Percy T. Phillips of New York, who was made trustee for the Second District.

Expiration of terms of office made necessary election of trustees for four districts. Percy T. Phillips of New York succeeds William McGill Burns as trustee for the Second District. Clarence S. Renouard of Butte, Mont., succeeds Fred

Newly Installed Officers •

1. LeRoy M. Ennis, president
2. Otto W. Brandhorst, president-elect
3. David J. Fitzgibbon, first vice-president
4. P. M. Cunningham, second vice-president
5. Oscar P. Snyder, third vice-president
6. Percy T. Phillips, trustee from the Second District
7. Clarence S. Renouard, trustee from the Eleventh District
8. Wm. R. Alstadt, trustee from the Twelfth District
9. B. C. Kingsbury, trustee from the Thirteenth District

S. Shandley of Seattle as trustee for the Eleventh District. Wm. R. Alstadt of Little Rock, Ark., is the new trustee from the Twelfth District, to succeed Willard Ogle of Dallas, Texas. B. C. Kingsbury of San Francisco was installed as trustee from the Thirteenth District to succeed R. C. Dalgleish of Salt Lake City.

H. B. Washburn of St. Paul, Minn., was reappointed treasurer for a period of one year. Harold Hillenbrand, who was reappointed secretary in 1949 for a term of three years, and Lon W. Morrey, who was reappointed editor in 1950 for a term of three years, will continue to serve in those capacities.

HONORARY MEMBERS

Honorary membership in the Association was conferred on Harlan H. Horner of Albany, N. Y., former secretary of the Council on Dental Education and specialist in the field of licensure and accreditation, for his service to the Association and the dental profession and his contributions to the advancement of dental education.

Frederick S. McKay of Colorado Springs, Colo., also received honorary membership, in his fifty-first year of dental practice, for his part in the "present and anticipated improvement in the dental health of millions of the world's population by the controlled use of fluorides," for his "especially noteworthy research" and his numerous other efforts, by which he has "contributed to the stature of dentistry as a profession."

LIFE AND ASSOCIATE MEMBERS

A total of 415 dentists from 40 states and the District of Columbia were elected to life membership.

Harold J. Caul of Washington, D. C., Ralph W. Phillips of Indianapolis, and Eugene W. Skinner of Chicago were elected to associate membership in the Association.

ACTIVITIES OF THE HOUSE OF DELEGATES

The first meeting of the ninety-second annual session of the House of Delegates of the Association, comprised of 379 dentists representing the 75,000 members of the 54 constituent dental societies in the 48 states and the territories, came to order on Monday, October 15 at 9:30 A.M.

Cyril de Vere Green, official representative from the British Dental Association, brought greetings from the B.D.A. and from the International Dental Congress which meets next year in London. Praising the unity of the profession which he had noted in the American Dental Association, he said he believed such unity was a guarantee that American dentistry would profit from the mistakes made in Great Britain where, under the National Health Scheme, dental treatment for the population was provided at the expense of dental health for children.

Dr. Green said Britain welcomed the United States' increasing participation in international affairs, and that the International Dental Congress also needed the support of American dentists.

Kenneth Adamson of Melbourne, vice-president of the Australian Dental Association, brought greetings from the dentists of his country. He agreed with Dr. Green that some extension of social services was inevitable. "However," he said, "in extending dental services in Australia we intend to begin with the child, and to that end we are striving and organizing and intend to fight for that principle to the last ditch."

Another spokesman for international dentistry was Josse de Wever of Antwerp, Belgium, assistant treasurer of the Féd-

ération Dentaire Internationale. Dr. de Wever echoed the statement of Dr. Green of the B.D.A., welcoming the increasing participation by the United States in international affairs, and stressed the importance of participation by American dentists in the program of the F.D.I. "We need more brains, more members, personal contacts—much more—and all this leads to international understanding," he said. "The F.D.I. should and could become the main traffic of dental research, and contribute to world peace."

Carlos J. Cornish of the Mexican Dental Association, now in its ninth year, presented fraternal greetings from his country; and Don W. Gullett of Toronto, Canada, an honorary member of the Association, presented greetings from the Canadian Dental Association, of which he is secretary.

Edward J. McCormick of Toledo, member of the Board of Trustees of the American Medical Association, brought greetings from the A.M.A.'s house of delegates and officers. Warning of the dangers of "socialization of those engaged in the healing arts," he deplored the "dangerous feeling of complacency in professional ranks" which he noted in his travels about the country. The dental and medical professions cannot be separated, he said. "If socialization invades one, it will follow as the night the day that it will invade the other," and that the great scientific advances being made would be curtailed by any form of government supervision.

CIVIL DEFENSE

Norvin C. Kiefer, director of the health and special weapons division of the Federal Civil Defense Administration, told the House of Delegates that in planning for civil defense the FCDA will need the services of every civilian member of the health professions, in addition to members of the general public, who must be recruited and trained. It is planned to use dentists as "auxiliary physicians," he said, and in addition to use oral surgeons in the treatment of maxillofacial injuries. National, state and local organizations will be required to aid in a well planned educational program to overcome public complacency, he said.

Urging that every dentist should enroll in his local civil defense organization, he cautioned that the program is an official FCDA one, and that "dentists and all others must act as citizens integrated under a civil authority." At the same time, he urged dentists to enroll in civil defense courses and to aid in the organization of new ones.

"Failure of joint efforts means failure of civil defense, and possible defeat if war comes," Dr. Kiefer warned. Every dentist should have a copy of the booklet, *Health Services and Special Weapons Defense,* obtainable for 60 cents from the Superintendent of Documents, Government Printing Office, Washington, D. C. Other booklets and training manuals will be available shortly, he said, including a manual for dentists. "I hope you will take strong, positive action at this meeting which will enable dentists to occupy the position in civil defense that they deserve," he said. (See pages 619, 637.)

REPORT OF THE PRESIDENT

Harold W. Oppice, president, summarized his activities during the year, highlight of which, he said, was serving as a member of the American Dental Association Mission to Japan. He also commented on several Association affairs requiring the attention of the House of Delegates.

Membership • Dr. Oppice reported that active membership in the Association dropped approximately 2.18 per cent up to August 31, but it was his opinion that the reduction was only temporary and resulted in part from calls to military service. He praised the consti-

tuent and component society officers and membership committees for their "yeoman service" in explaining the need for additional income from dues by the Association, and commended the Bureau of Public Information for its February 1951 *Information Bulletin* which, prepared in cooperation with the Council on Membership, was helpful in retaining active members.

All of the eligible dentists in Alaska are members of the Association, Dr. Oppice reported.

Although the proportion of members among dentists in the Federal dental services is much lower than among the civilian population, 80 per cent of eligible dentists in the Veterans Administration and the Air Force are members of the Association, Dr. Oppice reported. He gave special credit to Bion R. East, assistant chief medical director for dental service of the Veterans Administration, and to General George R. Kennebeck, chief of the Air Force Dental Corps, for their efforts in encouraging their dentists to maintain membership in the Association.

Blue Shield • Dr. Oppice reported he was repeatedly questioned as to why dentistry is not included in Blue Shield insurance policies, and urged that the resolution of the Council on Dental Health, made after a year of investigation, be adopted. The resolution recommended inclusion in Blue Shield plans of dental operations performed by eligible dentists, and that constituent and component societies be requested to study the Blue Shield plans in their areas and take steps to effectuate the recommendation. (See page 620.)

Social Security • With regard to a resolution on the agenda recommending the inclusion of dentists under the Old Age and Survivors Insurance provisions of the Social Security Act, Dr. Oppice expressed the opinion that support of such a resolution would "jeopardize greatly winning the fight against compulsory health insurance." (See page 620.)

Patient-Dentist Misunderstandings • President Oppice congratulated the Judicial Council for its work in studying the activities of component societies with regard to the hearing and adjudicating of misunderstandings between patients and dentists, and urged favorable action on the resolution submitted by the Council. (See page 623.)

Mission to Japan • Dr. Oppice reported that the Mission to Japan had made many suggestions for the betterment of Japanese dentistry to the Supreme Commander for the Allied Powers. Subsequently, Kazuo Sato, president of the Japanese Dental Association, expressed the gratitude of Japanese dentists in a letter which read as follows:

> The action taken by the American Dental Association in dispatching to Japan a five-member mission was of great importance to us here in that the extensive observations of the dental field in Japan by the mission members, and invaluable advice and guidance provided by them to us will greatly contribute to the future development of dental science and practice in this country.
>
> Please allow us to express our sincere gratitude and appreciation.

Dr. Oppice's report was received with the statement that his presidential year was "the zenith of many long years of outstanding service" to the Association, and he was complimented "most highly for his devotion to the profession."

The report of the Mission to Japan to SCAP appears on page 593 of this issue of THE JOURNAL.

ANNUAL BUDGET

Next on the agenda was the report of the Board of Trustees which, along with the budget, was referred to the appropriate reference committees for recommendations.

An increase of about $90,000 in income over the 1951 budget figure was reported, and a major part of it was attributed to the substantial increase in income from advertising in THE JOURNAL. A budget of $1,488,425 was approved for 1952 of which $75,000 is to be allocated to the Contingent Fund, and the unappropriated surplus of $203,919 is to be available for allocation to the Reserve Fund. The budget was approved.

Provision was included in the budget for an American Dental Association Film Library, to be an activity of the Bureau of Library and Indexing Service. Films from the library, which was described as a much needed service, will be made available to all constituent and component societies of the Association. Don A. Washburn, director of the Bureau, has stated he expects to complete organization of the library by approximately January 1, 1952.

The commission for the survey of dentistry, authorized in 1948, is to be continued, and a budget appropriation was authorized for this purpose in 1952. The Board of Trustees reported it expected to make a definite proposal to the House of Delegates on the possibilities of conducting a comprehensive, long range study of dental problems and practice, at the 1952 annual session.

It was reported that the Relief Fund has been made a beneficiary in the will of the late Walter T. Farrar of Louisville. The sum of $33,000 is to be given to the Relief Fund on the death of Dr. Farrar's sole remaining beneficiary. Both the Board of Trustees and the House of Delegates recorded their appreciation.

A resolution commending the Governor of Puerto Rico, the Hon. Luis Munoz Marin, for vetoing a bill which would have permitted "graduates of schools maintaining academic standards and classification below those required by this Association" to practice dentistry in Puerto Rico, was approved. A copy of the resolution, which was presented by Hector L. Bruno, president of the Colejio de Cirujanos Dentistas de Puerto Rico, is to be delivered to the Governor.

EMERGENCY DENTAL SERVICES

LeRoy M. Ennis, president of the Association, replaces Harold W. Oppice as chairman of the Special Committee on National Emergency Dental services, and E. R. Westcott of Atlantic City, N. J., new chairman of the Council on Dental Education, replaces E. R. Willits. Continued as members of the committee are Harold Hillenbrand, secretary of the Association; R. H. Friedrich of Plainfield, N. J., chairman of the Council on Federal Dental Services; and E. H. Gale of Albany, N. Y., chairman of the Council on Legislation.

By action of the House of Delegates, three new members were appointed to this committee: Leo J. Schoeny, dental member of both the Advisory Committee to the National Selective Service System and the Health Resources Advisory Committee to the Office of Defense Mobilization; James P. Hollers, dental representative of the Armed Forces Medical Policy Council; and Russell W. Bunting, dental consultant to the health and special weapons division of the Federal Civil Defense Administration.

A subcommittee also is to be appointed to study problems involved in dental participation in civil defense activities.

DENTAL MANPOWER

A resolution was passed which instructed the Council on Federal Dental Services to maintain a constant vigilance over the ratio of dentists to military personnel. At the same time, the Armed Forces Medical Policy Council is to be requested to "develop methods for utilizing dental officers in order to permit the Armed Services to meet their dental requirements with a minimum of dental manpower." The resolution was presented in cognizance of

the fact that the problem of adequate dental service in the present world situation embraces service to the armed forces, to civilians, and to patients of the Veterans Administration, and specialized service in the civil defense program, and that there is only a limited number of dentists to provide the service needed in those categories.

In the interest of conserving available dental manpower in a time of increasing national emergency, the Association is to urge the establishment of policies under which the mission of dental officers in the Armed Services will be limited to "maintaining and improving the efficiency of military personnel and . . . not be handicapped by the assignment of additional responsibilities in caring for the dental health of dependents of military personnel."

The House of Delegates adopted a resolution strongly recommending that every person inducted into the Armed Services be given a complete dental examination which would include full-mouth, intraoral and bitewing roentgenograms, emphasizing that this should be done with a minimum increase of dental officer personnel, and that the result of such examination be recorded and preserved as a part of the inductee's permanent health record.

Another resolution was approved which instructs that the establishment of rank and pay equivalent to the grade of major general for the position of chief of dental service in all uniformed services of the Federal government is to be sought by the Association.

The Councils on Dental Health and Federal Dental Services, and the Special Committee on National Emergency Dental Service, were directed to prepare "a statement on the limitations and scope of the dental health services to be provided by the Federal government to those enrolled in the Universal Military Training program, giving consideration to the liability for rendering future dental services by the Veterans Administration." The House also directed that agencies of the American Medical Association be consulted "in an effort to foster acceptable administrative and planning programs for the health activities . . . under the Universal Military Training Act."

OLD AGE AND SURVIVORS INSURANCE

The question of the inclusion of dentists under the Old Age and Survivors Insurance provisions of the Social Security Act was tabled until the next annual session, and in the meantime the constituent and component societies are to be encouraged to organize discussion groups for the purpose of obtaining full and clear understanding of the issues. The action was taken after all-day hearings revealed that further study was necessary. Two resolutions in favor of inclusion of dentists were introduced. One, from the Hawaii Territorial Dental Society, Hawaii County Dental Society, was rejected because the Hawaii Territorial Dental Society, after presenting the resolution, had taken opposite action. The House of Delegates, acting on a Massachusetts resolution, substituted another one which the House approved. The resolution took note of the "marked variation in opinion" that exists in the different regions of the country, and the fact that a survey conducted by the Council on Insurance indicates that opinion among Association members is about evenly divided. Thus, "if action were taken at the present time, such action inevitably would displease one or another large segment of the membership," the resolution stated.

VOLUNTARY PREPAYMENT PLANS

A resolution recommending the inclusion in Blue Shield voluntary prepayment plans of "dental operations performed by eligible dentists" was tabled, although the Council on Dental Health and the Reference Committee on Public Health recommended its adoption.

In another approved resolution, the Association recommends to constituent societies "that financial grants for underwriting voluntary prepayment dental plans be considered acceptable (1) if the funds are under full control of the . . . prepayment or the insurance organization; (2) if provision be made for an advisory committee selected by the official dental society affected; and (3) if there are no undesirable social, political or commercial implications involved in the acceptance of such grants as determined by the constituent society."

DENTAL PUBLIC HEALTH

Approving in principle the broad purposes of the Local Health Services Act of 1951, the House of Delegates directed that Congress be requested to define more specifically the provisions dealing with "adequate public health services" and "demonstrations." The Act, which as yet has received no Congressional action, is designed to assist states in developing and maintaining local public health units organized to provide basic full-time public health services.

The House of Delegates voted to support the development of public health units, and approved the policy of seeking grants-in-aid, where local funds are inadequate, "provided that the right of the state or community to adapt any program to its own needs is safeguarded."

An official policy was adopted governing the use of the name of the Association on dental health education materials. Permission will not be granted for the use of the name of the Association unless it is considered "in the interest of the public and the dental profession to do so." Statements of approval were adopted for use of such material, with a clause stating "This approval does not imply endorsement of any commercial product." Certain other safeguards to protect the name of the Association were included in the resolution.

In view of the need for an adequate standard classification of types of dental examinations, use of the *Standard Classification of Types of Dental Examinations and Inspections* by health agencies, schools, dental investigators, and others, is to be recommended, for the purpose of clearer definition and classification. The classification is a product of the Council on Dental Health.

The House gave formal approval also to the *Guide for Determining Need for Dental Inspections in School Health Programs,* prepared by the Council on Dental Health.

Five statements of general policy, formulated by the Inter-Association Committee on Health, were approved by the House. They concerned health personnel, medical care for those receiving public assistance, maternal and child health, the improvement and better distribution of nursing service, and community health councils.

FOCI OF INFECTION

The House of Delegates was requested to "disapprove" the review of the literature entitled "An Evaluation of the Effect of Dental Foci of Infection on Health," which appeared in the June 1951 issue of THE JOURNAL. The House rejected the resolution after receiving with applause the opinion of the Reference Committee on Public Health. The Committee expressed its belief that it is "the traditional right of every scientist . . . freely to express his views without fear of suppression by those who chance to disagree with him"; that "the problems involved in focal infection should not be solved by resolution but by further research . . ."; and that "the pages of THE JOURNAL are always open to articles of scientific value."

DENTAL EDUCATION

The House of Delegates reaffirmed the stand of the Association that postgraduate

dental education deserves the same concern given to undergraduate education, and that postgraduate education can be accomplished best by universities, professional dental societies and recognized hospitals, when it approved a resolution presented by the Dental Society of the State of New York.

A policy regarding the training of dental laboratory technicians was approved, which states that such training is to be on the level of vocational education, and that the length of the two-year course may be interpreted on the basis of the "clock hour equivalent" so as to permit the accreditation of accelerated courses as is now done in dental schools.

The House of Delegates approved the requirements of the American Board of Dental Public Health.

An amendment to the Bylaws was approved which removes from the Council on Hospital Dental Service the responsibility for approving (or disapproving) hospital dental intern and residency programs, and gives this responsibility to the Council on Dental Education. In another action, the Council on Hospital Dental Service was directed "to appoint state inspectors of hospitals only after consultation with the constituent society involved."

DENTAL RESEARCH AND THERAPEUTICS

The House of Delegates approved an amendment to the Bylaws which defines the duties of the Council on Dental Research as follows: "The Council on Dental Research shall promote, support and collect information on dental research and shall make recommendations on the means and methods for improving such research to the Board of Trustees for action in conformity with policies adopted by the House of Delegates." Other amendments to the Bylaws were approved which eliminate the Bureau of Chemistry and establish a Division of Chemistry under the supervision of the Council on Dental Therapeutics, and increase the membership of the Council on Dental Therapeutics to nine members.

The matter of the second revision of Specification No. 12 for Denture Base Material, being studied by the Council on Dental Research, was postponed indefinitely on request of the Council, which stated it needed more time to complete its report.

In a resolution presented by the Indiana State Dental Society, and approved by the House, the Council on Dental Therapeutics was directed to "seek a program under which either the manufacturing date or the expiration date shall be placed on the containers of all anesthetic solutions."

JOURNALISM

The Council on Journalism was commended for its efforts toward developing publication standards for constituent society publications, and a resolution approving a preliminary draft of such standards was approved. The final report will be submitted to the House of Delegates at a later date.

The Council was authorized to hold an annual or biennial conference for constituent society editors, and funds for this purpose were provided in the 1952 budget.

OTHER ACTIONS BY THE HOUSE

The House of Delegates approved amendment of the Bylaws to provide for the collection of historical dental material by the Bureau of Library and Indexing Service, these duties having previously been the responsibility of the Council on History, which was eliminated at the annual meeting in 1950.

A resolution presented by the Maine Dental Society proposed the adoption of the "universal system" for the designation of teeth, in order to encourage uniformity. The proposal was referred to the

Bureau of Library and Indexing Service for further study and report at the next annual session.

Membership • An amendment to the Bylaws was approved which will ensure that a dentist moving from one state to another retains active membership in the Association, if he is a member in good standing, for the calendar year following his removal from the jurisdiction of the state dental society of his former state of residence.

The Council on Membership was directed to survey the various Federal dental services to determine the proportion of dentists who were members of the Association in the years 1946-52, and to make appropriate recommendations . . . at the next annual session after completing the survey. The action was taken after consideration of a resolution by the Pennsylvania State Dental Society, which proposed "elimination of direct membership" to dentists in Federal service other than the armed forces, and reduction in membership fee for dentists serving in the armed forces during a national emergency.

A resolution from the Wisconsin State Dental Society regarding membership for dentists employed by Veterans Administration was rejected. It proposed that such dentists "be required to come into, and participate in, organized dentistry through the component society and constituent society serving the area in which they are employed."

Miscellaneous Matters • An amendment to the Bylaws to eliminate the advisory committees to the bureaus of the Association was approved.

A resolution presented by the Northeast District Dental Society of Arkansas, with the permission of the State Dental Society, recommended that the Association "investigate and endeavor to prevent premature publicity of dental treatments, dental medicines, dental appliances or dental equipment," until they have been approved by the Association and made generally available to the dental profession. The resolution was referred to the Bureau of Public Information for implementation.

The Bureau of Public Information was instructed also to "devote appropriate space in a forthcoming *Information Bulletin* to a discussion of problems mutually confronting the dental profession and the dental laboratory industry and craft."

The Bureau of Public Information was directed by the House to recommend to the public press that it instruct its employees to use the word "physicians" rather than "doctors." A copy of the resolution is to be forwarded to the agencies concerned.

A resolution from the Indiana State Dental Association, seeking amendment of Veterans Administration regulations to provide an extension to 90 days of the present 60-day limit for completion of dental service to a patient, was approved.

The House of Delegates approved "in principle" the maintenance of an agency in all component societies to adjudicate misunderstandings between patients and dentists, and resolved "that the component societies be requested to give particular attention to the name applied to such agency so that local needs and customs may be served."

A resolution regarding action on legislative matters is to be transmitted to the constituent and component dental societies. It states that "no constituent or component society should take any action at the Federal level except after consultation with the agency of the American Dental Association designated to represent the Association with regard to the subject matter concerned." A statement to the effect that it is to the best interest of the public and of the profession that the Association be the spokesman for dentistry in matters relating to the U. S. Congress or to Federal agencies accompanied the action.

An amendment to the Bylaws was adopted which designated the following section meetings for inclusion in each scientific session, unless omitted by the Council on Scientific Session: (a) prosthodontics; full denture; (b) prosthodontics: partial denture; (c) operative dentistry; (d) oral surgery and anesthesia; (e) orthodontics and oral development; (f) pedodontics; (g) periodontics; (h) practice management; (i) public health dentistry; (j) research; and (k) roentgenology.

A resolution of the Wisconsin State Dental Society requesting the Association to study professional liability insurance policies held by members with a view to increasing their usefulness was rejected. The action was taken on the basis that "Inasmuch as insurance regulations in the separate states are variable, any action . . . on a national level seems impractical." It was suggested that state societies should adjudicate their liability insurance with the insurance carriers in their own states.

The Oregon State Dental Association proposed that the Association be requested to seek the use of distinguishing insignia for dentists in the U. S. Air Corps. It was referred to the Council on Federal Dental Services for further study.

APPOINTMENTS TO COUNCILS

Following are new council members appointed by the House of Delegates, and new chairman of the Council on Dental Education, Council on Hospital Dental Service, Council on International Relations, Judicial Council, and Council on National Board of Dental Examiners, appointed by the Board of Trustees.

Constitution and Bylaws: Max E. Ernst of St. Paul, 1954; Jacob Feinman of Silver Lake, N. Y., 1954. *Dental Education:* Philip E. Blackerby, Jr. of Battle Creek, Mich., 1954; Gerald D. Timmons of Philadelphia, 1954; B. M. Tylicki of Long Beach, Calif., 1953, to fill the unexpired term of W. N. Hodgkin, who resigned; Henry M. Willits of Dubuque, Iowa, 1954. E. R. Westcott of Atlantic City, N. J., was appointed chairman to succeed Dr. Willits. *Dental Health:* Ira D. Beebe of Bridgeport, Conn., 1954; Francis A. Bull of Milwaukee, 1954; Harry K. Willits of Reading, Pa., 1954. *Dental Museum and Registry:* Henry A. Swanson of Washington, D. C., 1954; Kurt H. Thoma of Brookline, Mass., 1954. *Dental Research:* Henry M. Goldman of Boston, 1954; C. V. Rault of Washington, D. C., 1954. *Dental Therapeutics:* Thomas J. Hill of Cleveland, 1954; F. D. Ostrander of Ann Arbor, Mich., 1954. The Board of Trustees appointed four additional members to the Council after authorization by the House of Delegates. They are Theo Kaletsky of Jamaica, N. Y.; Philip Jay of Ann Arbor, Mich.; Paul C. Kitchin of Columbus, Ohio; and Floyd L. Paynter of Omaha, Neb. *Dental Trade and Laboratory Relations:* Earl M. Eaton of Cedar Rapids, Iowa, 1954; Frederick W. Herbine of Reading, Pa., 1954. *Federal Dental Services:* Marvin E. Chapin of Chicago, 1953; William S. Moyes of Ogden, Utah, 1954; F. J. Reichmann of Oklahoma City, 1954. *Hospital Dental Service:* Harold H. Hookway of Boston, 1954; Frank B. Hower of Louisville, Ky., 1954. Dr. Hower was appointed chairman to succeed Stephen P. Mallett of Boston. *Insurance:* R. M. Dunn of Tulsa, Okla., 1953, to fill the unexpired term of Harry Sorrels of Oklahoma City; Francis J. Herz of San Francisco, 1954; Paul W. Zillman of Buffalo, 1954. *International Relations:* Paul H. Jeserich of Ann Arbor, Mich., 1954; Oren A. Oliver of Nashville, Tenn., 1954. Don J. Aubertine of San Francisco was appointed chairman to succeed Stanley D. Tylman of Chicago. *Journalism:* Joe W. Jones of Dawson Springs, Ky., 1954; Charles A. Wilkie of Brooklyn, 1954. *Judicial Council:* Robert L. Heinze of Brooklyn, 1954; Myron E. Lusk of Minneapolis, 1953, to fill unex-

pired term of R. G. Keyworth of Saint Paul, who resigned. H. B. McCarthy of Baltimore was appointed chairman to succeed Ernest G. Sloman, who resigned. *Legislation:* E. Harold Gale of Albany, N. Y., 1954; Edward R. White of Jersey City, N. J., 1954. *Membership:* Edward W. Luebke of Chicago, 1954; John R. Wallace of Winchester, Mass., 1954. *National Board of Dental Examiners:* H. Weisengreen of San Francisco, 1954; Robert J. Wells of Chicago, 1954; Gordon L. Teall of Hiawatha, Kan., 1954. Dr. Wells was appointed chairman to succeed T. M. Birkbeck of Milton, Ore. *Relief:* M. R. Chipman of Spokane, Wash., 1954; Leo W. Kremer of Chicago, 1954. *Scientific Session:* Charles S. Kurz of Carlyle, Ill., 1954; Charles H. Patton of Philadelphia, 1954.

SECTION OFFICERS

The following section officers for 1952 were appointed by the Board of Trustees after receipt of their nomination from the Council on Scientific Session.

Dental Public Health: Bruce D. Forsyth of Washington, D. C., chairman; Milton E. Nicholson of Pittsburgh, vice-chairman. *Complete Denture Prosthesis:* Theodore A. Bodine of Akron, Ohio, chairman; Frank M. Kyes of Bethesda, Md., vice-chairman. *Operative Dentistry:* Morton Mortonson, Jr., of Milwaukee, chairman; Miles R. Markley of Denver, vice-chairman. *Oral Surgery:* H. Newman Brownson of Hollywood, Calif., chairman; Horace L. Cartee of Miami, Fla., vice-chairman. *Orthodontics:* William R. Joule of Newark, N. J., chairman; Robert M. Ricketts of Chicago, vice-chairman. *Partial Denture Prosthesis:* Alfred C. Young of Pittsburgh, chairman; Loren Dana Sayre of Chicago, vice-chairman. *Periodontics:* Walter Leabo of Shreveport, La., chairman; Rowe Smith of Texarkana, Texas, vice-chairman. *Pedodontics:* William A. Jordan of Minneapolis, chairman; Harold K. Addleston of New York, vice-chairman. *Practice Management:* Charles H. Kendall of Milwaukee, chairman; Ralph H. Campbell of Detroit, vice-chairman. *Roentgenology:* William J. Updegrave of Philadelphia, chairman; H. Cline Fixott, Jr., of Portland, Ore., vice-chairman. *Research:* John W. Knutson of Washington, D. C., chairman; George Paffenbarger of Washington, D. C., vice-chairman.

GENERAL MEETING AND OTHER EVENTS

Harold W. Oppice, speaking before an audience numbering well over 1,800 at the general meeting on October 16, declared the ninety-second annual session officially open and echoed the statement frequently expressed by those in attendance that special credit was due to David J. Fitzgibbon, for his work as chairman of the local arrangements committee.

He spoke of the tremendous advancement in the cause of dental health which took place during the year, but warned that certain political schemes could jeopardize the great scientific contributions made by the health professions. Nevertheless, "the house of American dentistry is in good order, as a result of establishing sound principles," he said, "and the 75,000 dentists who compose the Association know it is not enough to rest with pleasant memories of great advancement." They know that "dentistry must not stop with the provision of technical knowledge in dental health problems," but that "it must stand by vigilantly to prevent distortion of this knowledge to obtain objectives which are not in the best interests of the public."

"Compulsory health insurance would not solve the problem of meeting the

dental health needs of the public," Dr. Oppice declared. "Any such easy political solution will be as costly, destructive and unscientific as the present program in Great Britain."

Senator Robert A. Taft of Ohio, guest speaker, also warned of the dangers of socialized medicine. Although the proper function of the Federal Government in matters of health and welfare is in the field of research and advice, there are dangers in the doctrine, he said. The dangers lie in the present tendency of the Government to regulate the state and local governments, the Senator warned. The three requirements to remember in evaluating any new proposal in the field of health and welfare are that: (1) assistance must be applied only where the need is clearly shown, (2) free service must be given only to those unable to pay for themselves, and (3) any Federal assistance must be under the complete control of local and state governments, he said.

ARMED FORCES ANNIVERSARY LUNCHEON

A luncheon on October 16 in honor of the fiftieth anniversary of the Armed Services dental corps, had as its special guests Admiral C. V. Rault, dean, and the Reverend Edward Bunn, S. J., regent, of Georgetown University dental school; A. V. Astin, acting director of the National Bureau of Standards; and Maj. Gen. Walter D. Love, chief of the Dental Division, Army Surgeon General's office. Other distinguished guests were LeRoy M. Ennis of Philadelphia, president-elect of the Association; Percy T. Phillips, speaker of the House of Delegates; and Daniel F. Lynch, Fourth District trustee. In addition, Col. Edwin P. Tignor (Ret.) of Wicomico Church, Va., one of the original group of 30 dentists who entered the first Army Dental Corps in 1901, was introduced to the group.

Kenneth Crawford, senior editor of *Newsweek*, and guest speaker, spoke on the state of the world as he viewed it from his numerous visits abroad, and said he believed war with Russia seemed less likely now than it did a year ago. He believed that the world can have another century of peace and that prosperity can be brought to the other parts of the world, if the U. S. continues to use its "know-how" to establish foreign trade sources and outlets for raw materials, and operates "as an empire" for the good of the whole world.

PRESIDENT'S BANQUET

President Harold W. Oppice was honored by a banquet on October 17 at which he shared the head table with the presidents of the state dental societies, as well as with his colleagues on the Board of Trustees. Walter J. Gonwa, president of the Illinois State Dental Society, presented Dr. Oppice with a watch as a token of the regard in which he is held by Illinois dentists, and in recognition of his 25 years of service to dentistry in that state.

OTHER HIGHLIGHTS

Another highlight was a trip to the White House on October 16 at which members of the Board of Trustees met and were addressed by the President of the United States. Mrs. Truman welcomed the wives of trustees, members of the Women's Auxiliary of the District of Columbia Dental Society, and woman members of the Central Office staff, at a reception and tea at Blair House on October 10.

At an impressive ceremony at Arlington National Cemetery on October 16, President Harold W. Oppice, accompanied by officers of the Association, laid a wreath on the Tomb of the Unknown Soldier.

One of the most popular events was the symphony concert on October 15 at Statler Hotel, at which Henry Goldstein, Washington dentist, most ably conducted

an orchestra of professional musicians in a program which included works of Rimsky-Korsakow, Brahms, Rachmaninoff, Rodgers and Hammerstein, Strauss, and Tchaikowsky.

Social events sponsored by the Women's Auxiliary of the District of Columbia Dental Society included a lecture and tour of the National Gallery of Art, a luncheon and fashion show at the Shoreham Hotel, and many sightseeing trips.

HOMER C. BROWN LUNCHEON

More than 250 members of the dental profession, including the Board of Trustees and officers of the Association and the chiefs of the dental services of the Army, Navy, Air Force, Public Health Service and Veterans Administration, attended a testimonial luncheon for Homer C. Brown, oldest living past president of the Association, on October 15, at the Statler Hotel, Washington, D. C.

In his opening remarks Clyde E. Minges, chairman, and president of the Association in 1949, paid high tribute to Mrs. Brown, who was unable to attend because of illness, and to the guest of honor for his lifetime of service to the profession. Frank M. Casto, 1935 president of the Association, whose remarks were presented by Earl G. Jones of Columbus, Ohio, commented on Dr. Brown's analytical mind, photographic memory and qualities of leadership, which enabled him to contribute greatly to the reorganization of the Association in 1913. Brig. Gen. Oscar P. Snyder, director of dental activities of the Walter Reed Army Medical Center, stated that Dr. Brown's courage, determination and indomitable spirit, and his insistence on maintaining the highest standards and ideals for dentistry, have resulted in the recognition now accorded the dental corps in government services. J. Ben Robinson, 1943 president, recounted Dr. Brown's efforts in founding the Association's journal, in organizing its program of dental research, and in developing its legislative program. Arthur H. Merritt, 1940 president, complimented Dr. Brown for being one of those who regard no personal sacrifice too great for his profession.

In closing the program, President Harold W. Oppice, speaking on behalf of Dr. Brown's many friends, presented the "grand old man of dentistry" with a check in recognition of his many years of service to society.

SCIENTIFIC EXHIBIT AWARDS

The scientific exhibits this year were judged in three classes. In the *Federal Agencies* class, the U. S. Public Health Service won first place for its exhibit demonstrating the fluoridation of community water supplies, the utilization of auxiliary dental personnel, dental postgraduate education in USPHS, and recent developments in operative technic. Second place went to U.S. Veterans Administration Dental Service for its exhibit demonstrating the importance of diagnosis in oral lesions. The U.S. Navy Dental Corps won third place for two exhibits, one of which presented the career opportunities offered by the Navy for training and promotion of enlisted personnel as dental technicians, and the other of which demonstrated Navy dental practices and technics. Honorable mention winners were: Joseph L. Bernier, Armed Forces Institute of Pathology, for a presentation of the research and training activities of the Registry of Oral Pathology of the American Dental Association and the Armed Forces Institute of Pathology; the U. S. Air Force, for its mobile dental unit; and the U.S. Air

Force Dental Corps for its display showing equipment and apparatus used in joint research and development activities with the other Armed Services.

In the *Individual* class, the judges awarded first place to the exhibit on cleft palate prosthesis sponsored by Cloyd S. Harkins and William R. Harkins of Osceola Mills, Pa., and John F. Harkins of Erie, Pa. Jesse V. Boswell of Springfield, Mo., won second place for his exhibit, based on original research, demonstrating an approach to problems of denture balancing through recognition of true physiologic mandibular action. Third place went to an exhibit tracing the evolution and development of surveying and designing instruments for use in partial denture prosthesis, presented by Noble G. Wills of Connersville, Ind. Honorable mention was won by William P. Humphrey of Denver, for an exhibit of chrome steel space maintainers, thumb cribs and partial dentures for use in pedodontics; Joseph S., and Stuart J. Landa of New York, for an exhibit on the temporomandibular joint syndromes and the freeway space, and their significance in complete mouth rehabilitation; and Harry Kazis of Boston for his exhibit on complete mouth rehabilitation.

In the *Institutions, Associations, State and Local Government* class, an exhibit on the applications of aureomycin in dentistry won first place. It was sponsored by Lester H. Roth and Gerald J. Cox of the University of Pittsburgh dental school. Second place was awarded to an exhibit on cancer of the mouth sponsored by John B. Erich, Gordon B. New, and K. D. Devine of the Mayo Clinic, Rochester, Minn. An exhibit demonstrating the integration of research in a public school dental program, sponsored by Abram Cohen of the Board of Public Education of Philadelphia, won third place. Honorable mention winners were: M. Joel Freedman of New York University dental school, for a display showing the educational aspects of dentistry for children; Louis I. Grossman of the University of Pennsylvania dental school, for an exhibit on immediate root resection; Robert L. Fisher and Arnold C. Rosenberg, both of the Dental Guidance Council for Cerebral Palsy, United Cerebral Palsy Associations, Inc., for their display on the dental treatment of the cerebral palsied; the American Medical Association, for its exhibit entitled "Thanks to Animals," which portrayed the benefits to both animals and human beings of the use of animals in scientific research. A display of pictures relating to the martyrdom of St. Apollonia, patron saint of dentistry, presented by the Baltimore College of Dental Surgery, Dental School, University of Maryland, and an exhibit showing the opportunity of the dentist in cancer detection and control, sponsored by the American Cancer Society, also won honorable mention.

CONFERENCE ON DENTAL HEALTH

Water fluoridation and the status of the dental unit in a state health department were the main topics of the second annual conference on dental health, sponsored by the Association, on October 13 in Washington. The meeting, a forum-type conference, was attended by about 150 chairmen of state councils on dental health, state dental directors, and other public health workers.

Presentations by John G. Frisch of Madison, Wis., member of the fluoridation committee of the Wisconsin Dental Society; C. R. Cox of Albany, N. Y., chief of the water supply division of local health services, New York State Department of Health; John B. Benediktson of Oakland, Calif., president-elect of the California State Dental Association; and W. Philip Phair of Chicago, assistant

secretary of the Council on Dental Health of the Association, were each followed by a forum discussion.

Kenneth A. Easlick of Ann Arbor, summarizing the conference, stated that inaccurate information regarding water fluoridation is causing opposition to the dental health measure in some communities. Fluoridation should not be referred to as "a process of medicating water supplies," he said. Rather, fluoridation is a method for controlling the water supplies so that water deficient in fluorides can be brought up to optimum levels, and water containing an excess of fluorides can be reduced in fluoride content. The effects of fluoridation should be considered primarily from a nutritional viewpoint, he said.

Summarizing the discussion of technical problems, Dr. Easlick stated that every community with a water supply can adopt fluoridation because the chemical components are readily available and the equipment can be adapted from that used for other types of water treatment. Furthermore, he said, experience has shown that the maintenance cost of the equipment can be discounted completely, since it is so low. Newburgh, N. Y., for instance, where fluoridation has been in operation for five or six years, has had no repair maintenance costs.

The next step is to find means for bringing this health measure to rural areas where the water supplies come from private wells, he said, and research must be directed toward the problem.

With regard to the administrative status of a dental unit in a state health department, Dr. Easlick said that many of the participants stated the dental unit should have a type of administration that would permit it to function with the greatest amount of efficiency, and in relation to the size of the dental health problem in the state. It was pointed out that the chief dental officer should have the opportunity to participate in planning the program of the health department, he said, and also that there should be parity in salary of the dental officers with medical officers in similar administrative positions.

STATE SOCIETY OFFICERS

The Conference of State Dental Society Officers met on October 14 in Washington, D. C., and installed John B. Benediktson of Oakland, Calif., as president to succeed Wilbur P. McNulty of Fort Wayne, Ind. Earle S. Arnold of West Hartford, Conn., was elected vice-president, and Harry I. Wilson of Des Moines, Ia., secretary.

Francis A. Bull of Milwaukee, Wis., director of the division of dental health in the Wisconsin Department of Health, spoke on the responsibilities of a state dental society in the fluoridation program. He told the group that "the degree of acceptance that fluoridation . . . will receive in any state will be in direct proportion to the effort expended by the state dental society."

In accepting this responsibility, the state dental society has several goals to accomplish, Dr. Bull stated. The first of these is to adopt a "simple, positive policy on water fluoridation," and further to see that a similar positive policy is adopted by the state department of health. He suggested that a statement of policy such as: "The —— State Dental Society recommends and encourages the fluoridation of all public water supplies deficient in fluorides, where the program meets and maintains the standard set by the state department of health," permits no misunderstanding by either the den-

tists or the public. He said that "some of the policies of state departments of health are so worded that confusion or even opposition to the fluoridation program results," and warned that "any reference to toxicity, experimentation, artificial fluoridation, or industrial hazards . . . will only encourage opposition to the program."

Dr. Bull urged every dental society to appoint a fluoridation committee to aid in motivating the public to put such policies and recommendations regarding the health measure into practice. The committee must be acquainted with "all the answers to all the arguments against fluoridation, as well as all the answers to all the questions about why we should fluoridate, the methods, costs, and so forth." The committee should function in close cooperation with the dental and sanitary engineering division of the state department of health, he said, and its members give talks to local and district dental societies, medical societies, and public health and law groups, and should furnish materials and suggestions to local dental societies and dentists so that they in turn can give talks to interest local groups. The committee also should present the program to such state organizations as the state medical society, state public health groups, state water works operators, state municipalities associations, state parent teacher associations, and other teachers' associations and service groups.

Again urging action by the state dental society in these respects, Dr. Bull said that only when the state dental society has fulfilled its responsibility can we "conscientiously tell any community having a public water supply that the dental attack rates of the future will be determined to a great extent by the community itself," and that they must accept this responsibility.

Social security, and whether dentists should be included in the Old Age and Survivors Insurance provisions of the Act, was discussed by William McGill Burns, second district trustee. "A study [of the OASI provisions] of the Act convinces me that the so-called benefits should not prove as attractive to dentists as it would seem at first glance," he said.

He explained that under the Act, which at present excludes dentists, self-employed persons are covered only if their net income earnings are more than $400 per year. "Their net income up to $3,600 per year is taxable at 3¼ per cent, and will reach 4⅞ per cent in 1969," he said. Another fact not generally recognized is that if a person beyond the 65 year retirement age does not retire, "he must earn less than $50 a month in order to receive benefits from a system under which he would have to pay roughly 3 to 5 per cent of his net income over a period of years," Dr. Burns reported.

Urging careful study of "the philosophy and social concept in the Social Security Act," he expressed his concern with the philosophy under which "many in the dental field seek an extension of governmental intrusion into those affairs which are a personal responsibility, and which the individual can do better for himself." This is not a new doctrine, he reminded the group, but is implicit in our Constitution, and it was aptly stated by Abraham Lincoln:

> The legitimate object of government is to do for a community of people whatever they need to have done but cannot do at all or cannot do so well for themselves in their separate and individual capacities. In all that the people can individually do as well for themselves, the government ought not to interfere.

LeRoy M. Ennis, president-elect, discussed some of the problems which are the direct concern of the state dental societies, and pledged his aid in solving those problems. He recommended that state societies schedule their annual meetings so as not to conflict with other state society meetings, that they strengthen the scientific parts of their programs, and that they make use of the Association's

state speakers' program. He also urged that each state society take the initiative to see that a dentist representative is named to the state civil defense agency, and that each local dental society take similar action on the local level. Additional information regarding the role of the dentist in civil defense will be forthcoming from the Federal Civil Defense Administration, and the Association will forward all available information on the subject to each state society, he said.

Others on the program were Harold Hillenbrand, secretary of the Association, who spoke on the responsibilities of a state dental society to its component societies; Earle S. Arnold, secretary of the Connecticut State Dental Association, who described the public relations program in operation in Connecticut and stressed the importance of keeping dentists informed; and Herbert B. Bain, director of the Bureau of Public Information of the Association, who defined public relations and the principles behind a public relations program for a state dental society. Benjamin Weinrach, executive secretary of the Dental Manufacturers of America, and Wilmuth C. Mack, executive secretary of the American Dental Trade Association, discussed commercial exhibits at a state dental society meeting. Willard H. Hurley, president of the Oregon State Dental Association, spoke on licensure of dental laboratory technicians and expressed his opposition to such licensure because, he said, it "destroys the integrity of the profession." Herbert L. Bunker, president of the Kansas State Board of Dental Examiners, spoke on the subject of "Extension of State Reciprocity," from his experience in Kansas where the Kansas dental board is "authorized by law to sign a reciprocity agreement with any state which will give to dentists of our state the same rights and privileges which we extend to their registered dentists."

ASSOCIATED GROUPS

The *American College of Dentists* initiated 145 candidates at its convocation ceremonies on October 14. Among them was Sen. Lester C. Hunt (D., Wyo.), only dentist in the Senate. John A. Kolmer of Philadelphia, professor of medicine and director of the Institute of Public Health and Preventive Medicine, Temple University, also received the honorary degree. Three woman dentists were in the group: Josephine May Abelson of New York, Stella Risser of Houston, and Juanita Wade of Dallas, Texas.

The *American Association of Dental Editors,* at its annual meeting on October 13, installed Dorothea F. Radusch of Minneapolis as president, to succeed William P. Schoen, Jr., of Chicago. Loren B. Taber of San Francisco was made president-elect. Other officers elected were W. W. McQueen of Minneapolis, vice-president; W. C. McBride of Detroit, secretary-treasurer; and L. F. Bumgardner of Charlotte, N. C., editor.

The meeting, held in conjunction with the Council on Journalism of the Association, included a business session followed by presentations by Joe W. Jones, Jr., editor of the *Journal of the Kentucky State Dental Association* and member of the Council on Journalism of the Association, on the functions and purposes of a state dental society publication; Gerald G. Gross of Washington, D. C., editor of the *Washington Report on the Medical Sciences* and Washington correspondent for THE JOURNAL, discussed the reporting of scientific news; Dan E. Smith of Chicago, director of typography and design, Poole Brothers Printing Co., illustrated with lantern slides his talk on the design of a dental journal.

Board of Trustees • Top of page, standing (l. to r.): Daniel F. Lynch, Fourth District trustee; Harold Hillenbrand, secretary; J. B. Carr, Seventh District trustee; H. B. Washburn, treasurer; C. Willard Camalier, assistant secretary in charge of the Washington office; James E. John, Fifth District trustee; Charles I. Taggart, First District trustee. Seated: Percy T. Phillips, speaker, House of Delegates; Edward R. White, first vice-president; Harold W. Oppice, president; Alfred W. Chandler, second vice-president; LeRoy M. Ennis, president-elect.

BOARD OF TRUSTEES and

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of

AMERICAN DENTAL

WASHINGTON, D.C.,

HOUSE OF DELEGATES
the
ANNUAL SESSION
the
ASSOCIATION
OCT. 15-18, 1951

Board of Trustees • Top of page, standing (l. to r.) : John J. Hollister, business manager; Lon W. Morrey, editor; Obed H. Moen, Ninth District trustee; R. G. Dalgleish, Thirteenth District trustee; C. S. Foster, Tenth District trustee; W. Earle Craig, Third District trustee; M. F. Jarrell, third vice-president; L. M. Cruttenden, assistant secretary. Seated: Robert P. Thomas, Sixth District trustee; Willard Ogle, Twelfth District trustee; Fred S. Shandley, Eleventh District trustee; William McGill Burns, Second District trustee; L. H. Jacob, Eighth District trustee.

On the program also were Olin E. Freedman of Chicago, graphic arts consultant, who discussed ways of using printing budgets to best advantage; John J. Hollister, business manager of the American Dental Association, who reported on a Council survey on state dental publication advertising rates. Alan J. Davis, advertising manager of the Dentists' Supply Company of New York, spoke on the subject of state dental journals from the national advertiser's point of view.

The *American Association of Dental Examiners* installed John M. Hughes of Richmond, Va., as president to succeed Philip L. Schwartz of New Brunswick, N. J. New president-elect is Herbert L. Bunker of Junction City, Kan. Other newly elected officers are Carl A. Bumstead of Lincoln, Neb., secretary; Russell I. Todd of Richmond, Ky., first vice-president; and Archie A. Albert of Pawtucket, R. I., second vice-president.

John R. Wallace of Winchester, Mass., was installed as president of the *American Denture Society* at the twenty-third annual meeting of the organization. He succeeds Harold L. Harris of Denver, Colo. President-elect is Chester Perry of Detroit; vice-president is Victor L. Steffel of Columbus, Ohio; secretary is Arthur L. Roberts of Aurora, Ill. Leonard I. Kercheval of Houston, Texas; Samuel S. Cohen of Cleveland; and Emil Bollwerk of St. Louis, were elected to the executive council.

The *International College of Dentists* installed Ernest Charron, dean of the University of Montreal dental school, as president to succeed Brig. Gen. Louis H. Renfrow of Washington, D. C. New president-elect is Oren A. Oliver of Nashville, Tenn. Other elected officers are Elmer S. Best of Minneapolis, secretary; R. Gordon Agnew of San Francisco, treasurer; and William A. Sexton of Bristol, Va., vice-president. Frank Martin of Toronto, Ont., Canada, was elected a member of the executive council.

The *American Academy of Periodontology,* at the close of its thirty-fifth annual meeting, installed James E. Aiguier of Philadelphia as president to succeed Hunter S. Allen of Birmingham, Ala. Roy O. Elam of Nashville, Tenn., was made president-elect. Clark E. Chamberlain of Peoria, Ill., and Raymond E. Johnson of St. Paul, were reelected secretary and treasurer, respectively.

Newly installed president of the *American Society of Oral Surgeons* is W. T. Ewing of Akron, Ohio, who succeeds Horace L. Cartee of Miami, Fla. Other new officers, elected at the thirty-third annual meeting of the Society, are D. C. McRimmon of Fort Worth, Texas, president-elect; Don Bellinger of Detroit, vice-president; Frank B. Hower of Louisville, Ky., secretary; and G. Thaddeus Gregory of Indianapolis, council member.

Earle L. Lampshire of Lincoln, Neb., was installed as president of the *American Society of Dentistry for Children* at the close of the annual meeting of the organization in Washington, to succeed Hugo M. Kulstad of San Francisco. New president-elect is George W. Teuscher of Chicago. Other new officers include Hugh Keenan of Corning, N. Y., vice-president; and Henry M. Wilbur of Louisville, Ky., secretary-treasurer.

Cornelia Thompson of St. Louis was installed as president of the *American Association of Women Dentists* to succeed Josephine Irey of Denver. Regina David of Cleveland was made president-elect, and Florence E. Rich of St. Louis was elected secretary-treasurer.

Lorraine Thompson, 1950-51 secretary, stated that grants from the Gillette Hayden fund are available to aid women in their junior or senior year in dental school, and that grants for research by woman dentists also are available. Applications should be made by writing to the secretary, Florence E. Rich, 6508 Delmar Boulevard, St. Louis.

Membership totals 200, and membership in the American Dental Association

is a prerequisite to membership in the group, which urges all qualified women dentists to join, Dr. Thompson reported.

The *American Association of Public Health Dentists* installed Philip E. Blackerby, Jr., of Battle Creek, Mich., as president to succeed William A. Jordan of Minneapolis. Dr. Blackerby is dental director of the W. K. Kellogg Foundation.

Carl L. Sebelius of Nashville, Tenn., director of dental hygiene service for the Tennessee Department of Public Health, was chosen president-elect; and Robert A. Downs of Denver, director of the division of dental health of the Colorado State Division of Public Health, was elected secretary-treasurer. Newly elected members of the executive council are Francis I. Livingston of Helena, Mont., director of the dental health division of the Montana State Board of Health; and Franklin M. Erlenbach of Hartford, Conn., chief of the dental hygiene division of the Connecticut State Department of Health.

The *National Association of Seventh-Day Adventists Dentists* reported an attendance of approximately 100 at its annual meeting in Washington. Ross Stromberg of Ann Arbor, Mich., was installed as president to succeed Gerald A. Mitchell of Atlanta. New vice-president is Walter Dorn of Takoma Park, Md. Franklyn C. Nelson of Pomona, Calif., former editor, was elected secretary, and Albert E. Burns of Klamath Falls, Ore., former secretary, was elected editor.

Dr. Burns stated that the organization expected to admit the first students to a dental school sponsored by the N.A.S.D.A.D., at the College of Medical Evangelists in California, in 1953 or 1954. Membership in the group, prerequisite for which is membership in the American Dental Association, now totals 240, Dr. Burns reported, and junior membership with the same admission requirement also has been set up.

Betty Krippene of Oshkosh, Wis., was installed as president of the *American Dental Hygienists Association* at the close of the twenty-eighth annual meeting of the group. She succeeds Blanche C. Downie of Philadelphia. Evelyn Hannon of Portland, Ore., was chosen president-elect. Other new officers are Margaret Swanson of Washington, D. C., executive secretary; Elizabeth Ferm of Minneapolis, treasurer; Laura Peck of New London, Conn., first vice-president; Ann Ragsdale of Atlanta, Ga., second vice-president; and Sarah Hill of Memphis, Tenn., third vice-president.

The *American Dental Assistants Association* installed Steve Ann Montgomery of Dallas, Texas, as president to succeed Evelyn B. Brett of Etna, Pa., at the close of its twenty-seventh annual meeting. Marie Johnson of Portage, Wis., was elected first vice-president. Other new officers are Mary Ann Whalley of Los Angeles, second vice-president; Harriet Darling of Huron, S. D., third vice-president; Lillian Hoffman of Akron, Ohio, general secretary; and Lorena Kelly of Newton, Kan., treasurer.

Association Affairs

CIVILIAN EXPENDITURE FOR DENTAL CARE INCREASES

A report being prepared by the Association's Bureau of Economic Research and Statistics reveals that the civilian population spent approximately 6.4 per cent more for dental care in 1950 than in 1949, and 4.8 per cent more for physicians' services, according to B. Duane Moen, the Bureau's director. At the same time, expenditures for all medical and dental care, including hospitalization, drugs, dentists', physicians', osteopaths'

and chiropractors' fees, increased 7.4 per cent. Per capita expenditure in 1950 was $6.60 for dental care, $15.80 for physicians' services, and $56.30 for all medical and dental care.

The figures were based on those of the Department of Commerce published in the 1951 National Income Supplement of the *Survey of Current Business,* and are exclusive of governmental and philanthropic expenditures, Mr. Moen stated. The Bureau's analysis of personal consumption expenditures for dental care from 1929 to 1950 will be published in an early issue of THE JOURNAL.

Dentists' Fees Rise Less Than Total Cost of Living • Dentists' fees have risen at a slower rate than the total cost of living. The *Consumers Price Index* compiled by the U. S. Bureau of Labor Statistics reveals that dentists' fees rose 59 per cent between 1935-39 and June 1951, while the over-all cost of living rose 85 per cent. Medical care and drugs advanced in price 55 per cent. The latter figure includes dentists' and physicians' fees, hospital rates, group hospitalization, prescriptions and drugs. Physicians' fees rose 45 per cent in the same period.

GENEROUS GIVING URGED AS RELIEF FUND CAMPAIGN OPENS

Dentists were urged last month to contribute as generously as possible to this year's Relief Fund campaign which opened October 15. In a letter to every member of the Association, enclosing Christmas seals, Leo W. Kremer, chairman of the Council on Relief, pointed out that because of the generosity of members in the past, the Relief Fund "has been able to provide the minimum necessities of life for those unfortunate dentists who, by accident or illness, have been deprived of the means of making a living for themselves and the members of their families." This year's goal has again been set at $100,000, he said, but because the need is greater, it is important that each dentist this year increase his contribution. Dr. Kremer pointed out that the value of the seals is limited only by the generosity of the practicing dentists, and urged members to make this year's contribution just as generous as possible.

All contributions should be mailed to the American Dental Association Relief Fund, 222 East Superior Street, Chicago.

HARRY B. PINNEY, FORMER ASSOCIATION SECRETARY, DIES

The dental profession was saddened to learn of the death on October 18 of Harry B. Pinney of Chicago, former secretary of the Association.

H. B. Pinney

A 1900 graduate of the Chicago College of Dental Surgery, Dr. Pinney first practiced general dentistry and later specialized in oral surgery and exodontia. He served as assistant professor of oral surgery and exodontia at the Chicago College of Dental Surgery before assuming his duties as secretary of the American Dental Association in 1927. He had earlier served the Association as general

chairman of clinics for the sixty-seventh annual session in Dallas, Texas, in 1924, and in many other capacities including that of a delegate from Illinois.

The nearly two decades of administration by Dr. Pinney marked the period of greatest growth of the Association. Membership doubled to include more than 75 per cent of all eligible dentists; services and benefits to members increased; and contributions in research, educational, legislative and other activities solidified the position of dentistry among the health services on the foundation laid by earlier leaders of the profession.

Dr. Pinney served as president of the Chicago Dental Society in 1922-23, and earlier served as its treasurer. He was an active member of the executive council of the Illinois State Dental Association. At the time of his retirement in 1946, he had for nearly four decades served Xi Psi Phi dental fraternity on its supreme chapter board of directors, and for 23 of those years he served as supreme secretary treasurer.

He is survived by his wife, Marie.

A.D.A. TO BE REPRESENTED AT CIVIL DEFENSE MEETING

Members of the special committee on emergency dental services of the Association will attend a medical civil defense conference in Chicago November 9-10. The meeting, sponsored jointly by the American Medical Association, the American Hospital Association and the Association of State and Territorial Health Officers, in cooperation with the Federal Civil Defense Administration, is intended to accelerate and unify medical civil defense planning.

JOURNAL'S CIRCULATION UP 2,481 IN PAST FOUR MONTHS

Circulation of THE JOURNAL reached 77,741 on October 1, an increase of 2,481 over the June circulation of 75,260.

During the year ending June 30, THE JOURNAL published a total of 2,317 pages, including 1,512 pages of textual material and 806 pages of advertising. Broken down under general headings, the text pages were divided as follows: scientific articles, 799; case reports, 26; council reports, 150; editorials, 43; preliminary program, 43; news, 196; Washington news letter, 21½; international correspondence, 11½; reader comments, 17; current literature, 66; book reviews, 51; deaths, 28; directory, 24; announcements, 36.

Dental Societies

GREATER NEW YORK DENTISTS USE COLOR TV IN PROGRAM

Color television will be utilized to present surgical and other operative procedures at the Greater New York Dental Meeting, December 3-7, at the Hotel Statler, New York. In addition, the program will include clinics, exhibits, lectures, discussions and films, designed to present the latest scientific, sociological and technical advances in the dental sciences, it has been announced. The meeting is conducted annually by the First and Second District Societies.

Inquiries and requests for programs should be addressed to the Greater New York Dental Meeting, Room 106A, Hotel Statler, New York 1. Hotel reservations are to be made through the New York Convention and Visitors Bureau, 500 Park Avenue, New York 22.

Sigma Epsilon Delta • The Sigma Epsilon Delta fraternity has announced it will honor David Arkin, its treasurer for nearly 50 years, at its annual meeting on December 5 at the Hotel Statler, New York. Members have been asked to make their reservations through George J. Steibel, chairman, 130 West 86th Street, New York 24.

Joseph J. Obst, president of the Second District Dental Society of the State of New York, breaking ground for the organization's new building on September 28, when he claimed for his group the distinction of being the first dental society in the United States to build its own headquarters. Also participating in the ceremonies are (l. to r.) Charles M. McNeeley, past president of the society; Frank D. Schroth, publisher of the Brooklyn Eagle; and Rear Admiral Henry Delaney, inspector of Naval dental activities. Site of the building is at 111 Ft. Greene Place, Brooklyn.

Armed Forces

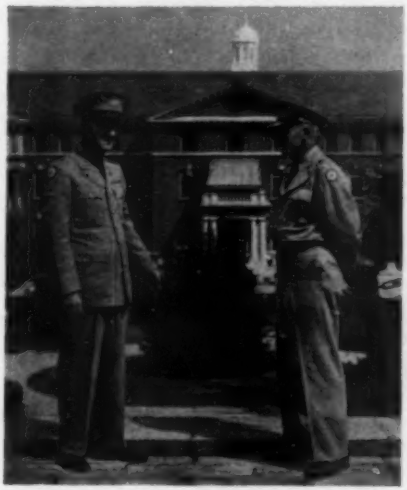
CROSBY NAMED TO NATIONAL ADVISORY COMMITTEE

President Truman has appointed Edwin F. Crosby, Baltimore physician, to fill the vacancy on the National Advisory Committee to Selective Service caused by the death in August of John B. Pastore of New York. Dr. Crosby will replace Dr. Pastore on the Health Resources Advisory Committee also, according to Charles E. Wilson, director of the Office of Defense Mobilization, who made the appointment.

Dr. Crosby is director of the Johns Hopkins Hospital, Baltimore, and was recently made president-elect of the American Hospital Association.

ARMY TO ACTIVATE 100 DENTAL RESERVE OFFICERS

The Army will order 100 Dental Reserve officers into active military service by November 12, it was announced by the Defense Department in late September. The dentists affected are in the Priority I group who were placed in the Dental Corps Reserve after stating their willingness to accept commissions when they registered with Selective Service. They will be assigned to installations in the U.S. and overseas to fill existing vacancies and replace officers scheduled for rotation or separation from the service, after a five-week basic course for dental officers at the Medical Field Service School, Fort Sam Houston, Texas, the Defense Department stated.



Brig. Gen. Oscar P. Snyder (l.), director of dental activities, and Col. Lynn C. Dirksen, commanding officer of the central dental laboratory, in front of the Walter Reed Army Medical Center shortly after that institution was renamed in September.

Although the institution has been popularly known as Walter Reed for 28 years, its official name was the Army Medical Center until it was changed by Army order in September.

TRUMAN RULES ON ORDER OF INDUCTION UNDER UMTS ACT

President Truman on September 28 issued new regulations governing the order of call-up under the Universal Military Training and Service Act. They instruct that selections for induction from Priorities I and III will be in order of age, starting with the youngest, and that induction from Priorities II and IV will be in the order of length of prior military service, starting with those who have previously served the shortest time.

Veterans Administration

W. W. HURST NAMED TO VA POST IN WASHINGTON, D. C.

The appointment of W. W. Hurst of Cleveland, Ohio, to the research and education division in the Veterans Administration central office in Washington, D. C., was announced in mid-October by Bion R. East, assistant chief medical director of VA Department of Medicine and Surgery.

Formerly professor of prosthetic dentistry at Western Reserve dental school, Dr. Hurst in his new post will be responsible for assessing requirements of the VA dental service in prosthodontia. He will have supervisory direction of VA's 20 central dental prosthetic laboratories and will have charge of a training program for prosthodontists and technicians which is to be launched soon at the central laboratory in Washington.

Legislation

IVES AMENDMENT IN HANDS OF SENATE FINANCE SUBCOMMITTEE

Senator Ives' proposal to amend the Revenue Act so that professional persons can utilize their peak earning years to set aside funds for retirement is in the hands of a Senate Finance Subcommittee and will be reported to the full committee next year, it is reported from Washington. Under its provisions, restricted amounts contributed annually to a pension fund would not be subject to income tax until the pension fund matured and its owner, at age 60, began drawing on it. The Association testified in its support in August, on the basis of the 1948 decision of the House of Delegates to endorse some form of tax relief for the professionally self-employed. Other organizations supporting it include the American Medical Association and the American Bar Association.

SENATE PASSES ARMY DENTAL BILL SPONSORED BY A.D.A.

The Army dental bill (S 781) was passed by the Senate on October 2. Introduced in February by Sen. Lester C. Hunt (D., Wyo.), the bill, sponsored by the Association, is intended to provide more efficient dental care for the personnel of the Army and Air Force. It provides for the general officer of the Dental Corps of each of the two services to be known as the Chief of the Dental Division of his service and to be responsible to his Surgeon General. His duties and responsibilities are defined in order to give him more control over dental affairs.

The bill also defines the Army and Air Force regulations stating the duties and responsibilities of staff dental officers, and provides authority for a ratio of not less than two commissioned dental officers for each 1,000 members of the respective services.

CONGRESS PASSES BILLS BENEFITING DENTAL CHIEFS

Two bills affecting the position of the chief dental officers of Federal services

were passed by Congress in the closing hours of the first session and now await Presidential action. One, HR 4205, sponsored in the House by Rep. L. Mendel Rivers (D., S.C.) and in the Senate by Sen. Lester C. Hunt (D., Wyo.) will assure pay equivalent to that of a major general to the chief of the Dental Division of the Navy Dental Corps and will grant retirement benefits as provided for a chief of a bureau. The other, S 1320, sponsored in the Senate by Sen. James E. Murray (D., Mont.) and in the House by Rep. Robert Crosser (D., Ohio), will grant the rank and pay of a major general to the chief dental officer of U.S. Public Health Service.

When these bills are signed by the President, the dental chiefs of all uniformed services will be on a par with each other and with their respective surgeons general in terms of both grade and pay.

SENATE CONFIRMS PROMOTION FOR USPHS DENTAL CHIEFS

The permanent rank of dental director was assigned to Bruce D. Forsyth, assistant surgeon general of U.S. Public Health Service, and John W. Knutson, chief of the USPHS Division of Dental Health, when the Senate, early in October, confirmed their promotion. At the same time Leonard A. Scheele, USPHS Surgeon General, was promoted to the permanent rank of medical director.

Two dental heads of USPHS hospitals also were promoted to the rank of dental director. They are Robert H. Moore of Stapleton, N. Y., and Ralph S. Lloyd of Baltimore.

The nomination of Col. Lynn Harold Tingay for promotion to the rank of Brigadier General also was confirmed by the Senate. Colonel Tingay is dental field services director at the Army Medical Department School at Fort Sam Houston, Texas.

Dental Education

SARA HILL MADE DIRECTOR OF DENTAL HYGIENE AT TENNESSEE

Sara E. Hill of Corinth, Miss., has been appointed director of dental hygiene at the University of Tennessee dental school, it has been announced by James T. Ginn, dean.

Miss Hill obtained her dental hygiene certificate from the University of Tennessee nursing school in 1934, and holds a Bachelor of Arts degree from the University of Mississippi and a Master of Public Health degree from the University of Michigan. She has formerly been associated with the Michigan Department of Health at Lansing, with the Mississippi State Board of Health in Tupelo, Miss., with the health department in Jackson, Miss., and served as a dental hygienist in Florence, Ala. She is a member of the American Dental Hygienists Association.

SIX THAI DENTISTS GET U.S. GRADUATE DENTAL TRAINING

Six dentists from Thailand are to receive graduate training in various dental specialties at U. S. dental schools during 1951-52, in a project arranged jointly by the Economic Cooperation Administration and U. S. Public Health Service, according to a USPHS news letter.

POSTGRADUATE COURSES AT OREGON DENTAL SCHOOL

The University of Oregon Dental School, Portland, has announced two one-week postgraduate courses for the month of December. A course in periodontia, by Lowell Peterson of San Francisco, is scheduled for December 3-7, and a course in ceramics, which will include porcelain jackets and inlays, is scheduled for December 10-14. Clinical work

will be incorporated in each course, the announcement stated.

Fee per course is $75. Enrollment is limited to 10. Details may be obtained by writing to Vinson M. Weber, Postgraduate Department, University of Oregon Dental School, 809 Northeast Sixth Avenue, Portland, Ore.

International

WHO OFFERS FELLOWSHIPS FOR STUDY ABROAD IN 1952

The World Health Organization is offering 10 to 14 fellowships to the United States, for foreign study during 1952 in "various branches of public health or such allied fields as medical or nursing education." The announcement came from Henry R. O'Brien of Washington, D. C., secretary of the Fellowship Selection Board appointed by Leonard A. Scheele, Surgeon General of U. S. Public Health Service.

Applicants must be engaged in full-time public health or educational work, and must know the language of the country to be visited, the announcement stated. Transportation and a stipend of $160 to $300 a month will be provided by WHO.

Applications must be filed in triplicate by January 1, 1952. Blanks for the purpose may be obtained from the Division of International Health, U. S. Public Health Service, Washington, D. C.

GUAM SEEKS DENTISTS FOR CIVILIAN POPULATION

The Government of Guam, largest and southernmost of the Marianas, West Pacific islands, "would appreciate applications from practicing dentists for a license to practice" in order to care for the civilian population. The information came in a special report to THE JOURNAL from R. S. Herman, Acting Governor of Guam, who stated that at present four practicing dentists in Guam are attempting to provide dental care for 30,000 local civilian residents of Guamanian ancestry, 3,500 off-island residents, in addition to 7,000 American and 12,000 Philippine nationals employed by contractors and cared for on a contract basis. The Navy formerly provided dental care for the population, the governor explained, but since the inauguration of civil government for the territory, the Navy's dentists and technicians have not been available to the local residents.

Requirements for licensure are graduation from a recognized dental school, a license to practice dentistry in one of the 48 states or a territory having laws of reciprocity with one of the states, or the taking of an examination in lieu of reciprocity.

The climate on Guam is similar to that of Florida or Honolulu, Mr. Herman stated, and "living on the Island can be pleasant and interesting for a person with intelligence, curiosity and adaptability."

Further details may be obtained by writing to the Executive Secretary, Commission on Medical Licensure, Government of Guam.

JAMES S. WALLACE, BRITISH DENTIST AND PHYSICIAN, DIES

Word has been received of the death of James Sim Wallace of Kingston, England, on July 13 at the age of 82.

Doctor Wallace, who was born in Scotland, earned his medical degree at the University of Glasgow before studying dentistry. He was lecturer in preventive dentistry in the dental school of King's College Hospital and lecturer in dental surgery and pathology at the London Hospital. He was honorary president of the stomatological section of the sixteenth International Medical Congress, and twice president of the dental officers

group of the Society of Medical Officers of Health. He was president of the British Society for the Study of Orthodontics, vice-president of the Food Education Society, and honorary member of the British Dental Association.

In the United States, Dr. Wallace was a Fellow of the American College of Dentists and an honorary member of the American Stomatological Association. In addition he was an honorary member of the New York Academy of Dentistry and the alumni association of the University of Southern California dental school.

He was a prolific contributor to the dental and medical literature, especially in the field of nutrition and prevention of disease. His work won him many awards, including the John Tomes prize, the Cartwright medical and prize of the Royal College of Surgeons, and the Neech prize of the Medical Officers of Health.

He is survived by his wife and two sons.

Public Health

INDIANA SCHOOL DENTAL PROGRAM HONORS PARTICIPANTS

The termination of Indiana's Richmond Dental Demonstration Survey will be marked by a meeting on November 7, in Richmond, to which all Indiana dentists and school superintendents have been invited, it has been announced by Maynard K. Hine of Indianapolis, chairman of the Council on Dental Health of the Indiana State Dental Association.

The five-year project, sponsored jointly by the Richmond schools, the Indiana State Dental Association, the Indiana State Board of Health, U. S. Public Health Service, and the Richmond Dental Society, included complete dental care, exclusive of orthodontics, for all children in the public and parochial schools in the first nine grades, regardless of their financial position, Dr. Hine stated. Aims of the survey, briefly stated at the start of the program, were: (1) to determine the annual increment of dental caries in the children while they were receiving regular dental care at the project's clinics; (2) to determine the

Center of interest in this photograph is the water fluoridation machinery (arrow) at Assumption, first Illinois community to start fluoridating its water on a nonexperimental basis. The photograph was taken on September 6, when W. Philip Phair (l.), assistant secretary of the Council on Dental Health, turned on the machinery at a ceremony attended by city officials and public health representatives. In the center is Glen P. Walker, Assumption dentist; at the right are (l. to r.) W. B. Stein, mayor, and W. R. Price, city alderman and chairman of the water committee.

Standing next to Dr. Phair are (l. to r.) J. F. Lewis of Chicago, regional dental consultant, U.S. Public Health Service; L. S. Kleinschmidt of Chicago, health program representative, USPHS; John E. Chrietzberg of Springfield, chief, bureau of dental hygiene, Illinois State Department of Health; George Le Charite, Assumption city attorney; and John E. Zur of Aurora, regional consultant, Illinois State Health Department.

amount of dental services each dentist can render and the manner in which he can increase such care with the use of auxiliary personnel, and at the same time to measure the demand for dental care and (3) to encourage the development of proper habit patterns in the children so that they will continue regular visits to their private dentists when they leave the ninth grade. The project was designed to augment, and not to supplant, private practice, it was pointed out by George W. Waterman, director of the Richmond program in the public schools.

The November 7 session, to be held at the Richmond Leland Hotel, is designed in part to thank the school officials and dentists of Richmond for their cooperation in the project. It will begin with an open house, and inspection of a dental clinic in operation at a junior high school in the city. Speakers will include Dr. Waterman; L. E. Burney, Indiana Commissioner of Health; M. E. Swihart, superintendent of public schols in Kokomo; Paul C. Garrison, superintendent of public schools in Richmond; Walter Crum of Richmond; Earl Jones of Cincinnati; Byron Lingeman, Crawfordsville physician; Allen O. Gruebbel, secretary of the Council on Dental Health of the Association; Roy D. Smiley and Charles L. Howell of the Indiana State Board of Health; and Otto W. Brandhorst, dean of Washington University dental school, St. Louis.

HENSHAW NAMED DIRECTOR OF DENTAL HYGIENE IN IOWA

The appointment has been announced of Charles H. Henshaw, of Des Moines, as director of dental hygiene in the Iowa State Department of Health effective October 1.

Formerly in private practice in Des Moines, Dr. Henshaw succeeds Olin E. Hoffman, who became dental director of the Washington State health department a year ago.

General

DENTAL HISTORIANS FORM OWN NATIONAL ORGANIZATION

The first national organization devoted to a study of the historical aspects of dentistry was created on October 16, when a group of dental historians from all parts of the country met in Washington and founded the American Academy of the History of Dentistry.

The group elected as its president J. Ben Robinson, dean of the Baltimore College of Dental Surgery, dental school, University of Maryland. Arthur H. Merritt of New York was made president-elect, and H. L. Faggart of Philadelphia was elected secretary-treasurer.

The executive committee is composed of Milton B. Asbell of Camden, N. J., John E. Gurley of San Francisco, G. B. Denton of Chicago, John M. Fleming of Raleigh, N. C., and Lloyd W. Johnston of Denver.

BROWNSVILLE, TEXAS, NEEDS PRACTICING ORTHODONTIST

Brownsville, Texas, needs a practicing orthodontist, according to a survey made by that city's Board of City Development. General practitioners also are needed to care for the 50,000 population, the Board has announced.

In a special report to THE JOURNAL, the Board of City Development stated that the city has no orthodontist and there is none nearer than Corpus Christi or San Antonio. Brownsville dentists and physicians, who were consulted during the survey, have offered "full cooperation in developing a practice for a qualified orthodontic specialist," the Board stated, and offered its own "maximum assistance" also.

Further information may be obtained by writing to the Board of City Development, Brownsville, Texas.

Washington News Letter

In the National Capital, the executive branches of the Federal government again are the main news centers, now that Congress is in adjournment. But, since it is a matter of only eight weeks or so until a new session is inaugurated on Capitol Hill, one may anticipate a fresh burst of activity on health, medical and dental legislation in the not too distant future—particularly in view of its political angles in a national election year.

COMPULSORY HEALTH INSURANCE

President Truman's informal remarks to American Dental Association officers when they were received at the White House last month made it clear that he still champions compulsory health insurance, notwithstanding his "soft pedaling" of that issue all year. Its revival for campaign purposes in 1952 is a certainty, just as there is every sign that the question of Federal financial support of dental and medical colleges will be a subject for debate in numerous contests for Congressional seats.

In the meantime, developments in the military establishment, the defense mobilization agencies and Veterans Administration will be watched with interest. Reforms dealing with utilization of dental personnel in military service are expected to be instituted following the return of W. Randolph Lovelace II, chairman of the Armed Forces Medical Policy Council, early in November, from an extended inspection tour in Asia and Europe. Further anti-inflation controls now under study by the Government may have a bearing on the evolution of prepaid dental and medical care plans, as well as development of industry-supported health programs. In the Veterans Administration, one of many provocative policy matters now pending is whether the dental service shall receive a greater measure of administrative independence in the Department of Medicine and Surgery.

DENTISTS AND SALARY RESTRICTIONS

An economic step of importance to the nation's salaried dentists is the recent ruling by the Office of Salary Stabilization that members of dental and medical professions shall be treated on a like basis with reference to eligibility for exemption from salary "freeze" regulations. Substance of the official interpretation is that pay restrictions are inapplicable to them, provided they are employed in a professional capacity to perform clinical duties. Thus, they are exempt if their services are given in a hospital sanitarium or outpatient clinic. But those employed privately by other dentists or physicians, or by dental firms, insurance companies and other corporations, are subject to salary control regulations.

SELECTIVE SERVICE CONFERENCE

Meriting more than passing attention is the conference, conducted in closed session, held here in mid-October and attended by dental members of the Selective Service advisory committees in the various stages. Dual purpose of the meeting was to answer questions on essentiality deferments and other problems and to present a progress report coming from the parent advisory committee to Selective Service. This was given to the conferees by the member who represents the dental profession, Leo J. Schoeny, of New Orleans. His report was in the nature of a preview, in outline form, of a comprehensive, detailed report on the country's dental manpower resources which was to be laid before the Health Resources Advisory Committee at its San Francisco meeting in late October

Unofficially, it was learned that points stressed by Dr. Schoeny were that understaffing of some dental school faculties, largely the result of losses to the military, is reaching serious proportions; and that the size of the pool of young dentists in Priority I is adequate to accommodate dental requirements of Army, Navy and Air Force until the middle of 1952 or beyond. This is based on the premise, of course, that there will be no order for all-out mobilization.

FEDERAL AID TO DENTAL SCHOOLS

Failure of efforts on the Senate floor in waning days of Congress to pass a bill for aid to medical, dental and nursing schools was attributable to reluctance to assume a new spending program at a time when the great bulk of Government appropriations are being directed to armaments. Senator Robert A. Taft, of Ohio, virtually said as much in his address before the American Dental Association in Washington

on October 16, when he explained that he had been impelled to vote against "one or two meritorious proposals" because of their cost.

Should there be a worsening of the international picture in 1952 and a consequent acceleration of the build-up in military strength, it is not improbable that advocates of Federal support of professional education will renew demands for enactment as a defense necessity whose cost is justifiable on the same basis as 'planes, guns and other military requirements. Another important factor in this connection is the impending report and recommendations of the National Security Training Commission; in particular, the criteria prescribed for medical and dental examination and treatment of youths who would be called up for universal military training. By the time this appears in print, the NSTC report will have been made public, but action by Congress in 1952 will be required to effectuate its recommendations.

NATIONAL DENTAL RESEARCH INSTITUTE

Emphasis upon military spending likewise is responsible for Congressional unwillingness to allot funds for construction of a building to house the National Dental Research Institute. In one of his convention addresses, ADA President Harold W. Oppice pointedly called attention to the fact that millions of dollars have been appropriated, nevertheless, for other Federal research endeavors within the past year while the dental research building still exists only on paper.

Incidentally, a meeting of the institute's advisory council in October came shortly before opening of the convention. The council took 14 applications for research grants under consideration, aggregating slightly more than $100,000. Recommendations as to approval, disapproval or postponement of action have not yet been disclosed. Final action on the requests will be taken by Leonard A. Scheele, Surgeon General of U. S. Public Health Service, probably late this fall.

Discussions of the council members, comprising both dentists and laymen, centered around Congressional treatment of the National Dental Research Institute as the "stepchild" among component research units comprising the National Institutes of Health. Spirited expression was given to the complaint that, with the notable exception of the American Dental Association, practically no outside organizations of influence are fighting the cause of adequate Federal support of research in dental problems.

Attending their first council meeting, as newly installed members, were Francis J. Reichmann of Oklahoma City, and A. P. Black of Gainesville, Fla.

CHLORESIUM TOOTHPASTE: PRELIMINARY REPORT

A chlorophyll toothpaste is the subject of a current magazine article.[1] In view of the probable inquiries which will be directed to dentists, the Council on Dental Therapeutics has authorized the publication of the following preliminary report. A comprehensive report will appear in a later issue of THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION.

Chloresium Toothpaste has been submitted to the Council on Dental Therapeutics for re-evaluation. In support of the claims for the product, the firm has furnished several unpublished reports of clinical studies and some colored slides depicting the appearance of gingival tissues before and after the use of the dentifrice.

A Council referee reports as follows:

"These case reports are unimpressive as evidence in support of periodontal therapeutic claims made by the firm. The photographic evidence reveals nothing that is not routinely accomplished by basic measures without the use of Chloresium products. In a number of these cases several therapeutic measures were employed; yet the results were attributed to the use of Chloresium products, without the benefit of controls. As judged by the photographic evidence in several of these case reports, doubt may be expressed with reference to the diagnosis and statements concerning etiology."

Since the Council's preliminary consideration of the available evidence gives rise to grave doubts about the remarkable statements' concerning this dentifrice, the profession may be well advised to adopt a conservative attitude toward this subject until a more comprehensive examination can be completed.

1. Better Homes and Gardens. (Nov.) 1951, p. 32.

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Announcements

MEETINGS OF THE AMERICAN DENTAL ASSOCIATION

Ninety-Third Annual Session	Sept. 8-11, 1952	St. Louis
Ninety-Fourth Annual Session	Sept. 28-Oct. 1, 1953	Cleveland
Ninety-Fifth Annual Session	Nov. 8-11, 1954	Miami

MEETINGS OF STATE SOCIETIES

State	Date	Place	Secretary	Address
Alabama	Apr. 14, 15, 1952	Birmingham	G. W. Matthews	1922 Tenth Ave., S., Birmingham 5
Alaska	July 14-17, 1952	Anchorage	R. A. Smithson	Box 1293, Anchorage
Arizona		Phoenix	E. M. Scott	1017 Professional Bldg., Phoenix
Arkansas	Apr. 6-9, 1952	Little Rock	D. M. Hamm	White Bldg., Clarksville
California	Apr. 21-23, 1952	San Francisco	L. R. Ludwigsen	450 Sutter St., San Francisco
S. California			C. A. Moss	1401 S. Hope St., Los Angeles
Colorado	Oct. 5-8, 1952	Colorado Springs	R. A. Downs	724 Republic Bldg., Denver 2
Connecticut	May 21-23, 1952	Bridgeport	E. S. Arnold	37 Linnard Rd., W. Hartford
Delaware	Jan. 1952		S. J. Krygier	309 S. State St., Dover
District of Columbia	Mar. 9-12, 1952	Washington	K. H. Wood	202-1835 Eye St., N. W., Washington
Florida	Apr. 20-23, 1952	Jacksonville	T. A. Price	808 Congress Bldg., Miami
Georgia			J. M. Heard, Jr.	Persons Bldg., Macon
Hawaii		Honolulu	J. H. Dawe	810 N. Vineyard St., Honolulu 17
Idaho	June 30-July 2, 1952	Sun Valley	F. E. Carpenter	123 Main Ave., Twin Falls
Illinois	May 19-22, 1952	Springfield	P. W. Clopper	623 Jefferson Bldg., Peoria 2
Indiana	May 12-14, 1952	Indianapolis	E. E. Ewbank	Kingman
Iowa	May 5-7, 1952	Des Moines	H. I. Wilson	639 Insurance Exchange Bldg., Des Moines
Kansas	May 4-7, 1952	Topeka	F. A. Richmond	Brotherhood Bldg., Kansas City
Kentucky	Mar. 31-Apr. 2, 1952	Louisville	A. B. Coxwell	1976 Douglas Blvd., Louisville
Louisiana	Apr. 17-19, 1952	Shreveport	J. S. Bernhard	407 Medical Arts Bldg., Shreveport
Maine	June, 1952	Rockland	S. Gower	Skowhegan
Maryland	May 4-7, 1952	Baltimore	E. L. Pessagno, Jr.	415 Medical Arts Bldg., Baltimore 1
Massachusetts	May 4-7, 1952	Boston	H. E. Tingley	12 Bay State Road, Boston
Michigan	Apr. 21-23, 1952	Detroit	F. Wertheimer	Michigan Dept. of Health, Lansing
Minnesota	Feb. 18-20, 1952	St. Paul	C. V. E. Cassel	242 Lowry Medical Arts Bldg., St. Paul
Mississippi	June 9-12, 1952	Biloxi	H. M. Campbell	428 Gloster St., Tupelo
Missouri	Sept. 12, 1952	St. Louis	R. R. Rhoades	201 Merchants Bank Bldg., Jefferson City
Montana	May 1-3, 1952	Butte	C. S. Renouard	304 Phoenix Bldg., Butte
Nebraska	May 12-14, 1952	Omaha	F. A. Pierson	1112 Federal Securities Bldg., Lincoln
Nevada	June, 1952	Reno	R. La Fond	Medical Dental Bldg., Reno
New Hampshire	June 29-July 1, 1952	Bretton Woods	F. E. Williams	814 Elm St., Manchester
New Jersey	Apr. 23, 24, 1952	Atlantic City	J. G. Carr	407 Cooper St., Camden
New Mexico			J. S. Eilar	Suite 7, Medical Arts Square, Albuquerque
New York	May 12-15, 1952	Syracuse	C. A. Wilkie	1 Hanson Place, Brooklyn
North Carolina	May 11-14, 1952	Pinehurst	B. N. Walker	Liberty Life Bldg., Charlotte
North Dakota	May 15-17, 1952	Minot	J. H. Lunday	302 Black Bldg., Fargo
Ohio	Nov. 25-28	Cleveland	E. G. Jones	185 E. State St., Columbus
Oklahoma	Apr. 20-23, 1952	Oklahoma City	R. C. Calkin	Calkin Bldg., Guthrie
Oregon	Mar. 3-5, 1952	Portland	H. C. Fixott, Jr.	308 Selling Bldg., Portland
Panama Canal Zone	Dec.	Balboa	O. Slavin	Box 415, Balboa
Pennsylvania	May 4-7, 1952	Reading	M. D. Zimmerman	217 State St., Harrisburg
Puerto Rico	Jan. 1952	San Juan	R. Carrasquillo	Box 214, Rio Piedras
Rhode Island	Jan. 1952	Providence	M. L. Biderman	144 Westminster St., Providence
South Carolina		Greenville	J. R. Owings	7 Medical Court, Greenville
South Dakota	May 18-20, 1952	Mitchell	E. W. Elmen	Sioux Falls
Tennessee	May 5-7, 1952	Memphis	W. L. McCulley	Brown Bldg., Cleveland

State	Date	Place	Secretary	Address
Texas	Apr. 28-May 1, 1952	Fort Worth	W. Ogle	3607 Gaston Ave., Dallas
Utah			E. O. Thompson	915 Medical Arts Bldg. Salt Lake City
Vermont	May, 1952	Woodstock	W. J. Reardon	Rutland
Virginia	Apr. 28-30, 1952	Virginia Beach	J. E. John	804 Medical Arts Bldg., Roanoke
Washington	May 15-17, 1952	Seattle	C. R. Flood	230 Cobb Bldg., Seattle
West Virginia	July, 1952	White Sulphur Springs	A. B. Drake	508 West Virginia Bldg., Huntington 1
Wisconsin	Apr. 14-17, 1952	Milwaukee	R. A. Mason	964 N. 27th St., Milwaukee
Wyoming		Casper	T. J. Drew	State Capitol Bldg., Cheyenne

MEETINGS OF STATE BOARDS OF DENTAL EXAMINERS

State	Date	Place	Secretary	Address
Alabama	June 16, 1952	Birmingham	M. D. Edwards	132 Adams Ave., Montgomery
Alaska	July 7-11, 1952	Anchorage	J. H. Geyer	P. O. Box 915, Juneau
Arizona			R. K. Trueblood	25 N. Second Av., Glendale
Arkansas	June 23-26, 1952		H. O. Weatherly	205 Halter Bldg., Conway
California			K. I. Nesbitt	507 Polk St., San Francisco 2
Colorado	June 23-27, 1952	Denver	C. K. Phillips	724 Republic Bldg., Denver 2
Connecticut	Nov. 6-10*	Hartford	C. G. Brooks	302 State St., New London
Delaware			P. K. Musselman	143 W. Main St., Newark
District of Columbia			W. M. Falls	1801 Eye St., N. W., Washington 6
Florida	July 7-12, 1952*	Jacksonville	A. W. Kellner	P. O. Box 155, Hollywood
Georgia			S. H. Yarbrough	Medical Arts Bldg., Columbus
Hawaii			H. L. Houvener	427 Dillingham Bldg., Honolulu
Idaho			W. K. Adams	718 Arthur St., Caldwell
Illinois	Nov. 6-9*	Chicago	W. A. McKee	503 Wood Bldg., Benton
Indiana	Nov. 12-15*	Indianapolis	C. A. Frech	504 Broadway, Gary
Iowa			H. M. Willits	719 Roshek Bldg., Dubuque
Kansas	Dec. 10-14	Kansas City	G. L. Teall	Box 71, Hiawatha
Kentucky			R. I. Todd	Western Union Bldg., Richmond
Louisiana			A. R. deNux	Marksville
Maine			R. A. Derbyshire	Box 387, Skowhegan
Maryland	Nov. 5-7	Baltimore	H. Levin	3429 Park Heights Ave., Baltimore 15
Massachusetts			J. C. Wilson	State House, Boston 33
Michigan	Jan. 27-Feb. 2, 1952	Ann Arbor	J. L. Champagne	3714 W. McNichols Road, Detroit 21
Minnesota	June 8-14, 1952		F. A. Larson	1632 Washington St., N.E., Minneapolis
Mississippi	Jan. 7, 1952	Jackson	J. C. Boswell	508 Lamar Life Bldg., Jackson
Missouri			R. R. Rhoades	Central Trust Bldg., Jefferson City
Montana			P. M. Feda	Box 865, Helena
Nebraska			C. A. Bumstead	924 Stuart Bldg., Lincoln
Nevada			G. C. Steinmiller	Masonic Temple, Reno
New Hampshire			J. B. Brown	5 N. State St., Concord
New Jersey			W. A. Wilson	150 E. State St., Trenton 8
New Mexico			J. J. Clarke, Sr.	Artesia
New York			D. W. Beier	23 S. Pearl St., Albany 7
North Carolina			F. O. Alford	1109 Liberty Life Bldg., Charlotte 2
North Dakota			A. B. Crabtree	Ellendale
Ohio			H. B. Smith	322 E. State St., Columbus
Oklahoma			J. B. Cole, Jr.	706 Asp, Norman
Oregon	Dec. 3-6*	Portland	A. F. Davis	306 Public Service Bldg., Portland
Pennsylvania	Dec. 3-5§ Dec. 6-8** Dec. 8††	Philadelphia	R. E. V. Miller	Northampton National Bank Bldg., Easton
Puerto Rico		Santurce	L. C. Coll	Box 3717, Santurce
Rhode Island			F. M. Hackett	267 Academy Ave., Providence
South Carolina			E. G. Bumgardner	1517 Hampton St., Columbia
South Dakota			K. A. Stormo	Lead
Tennessee			F. S. Maxey	804 Bennie Dillon Bldg., Nashville 3
Texas			R. T. Weber	312 Capital National Bank Bldg., Austin

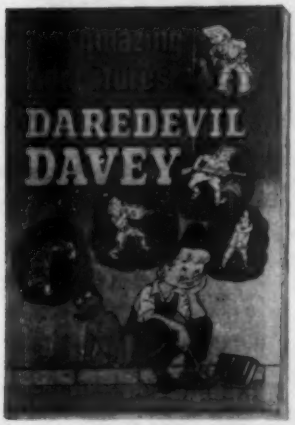
*Dentistry and dental hygiene.
**Dental clinical examinations.

§Dental and dental hygiene written examinations.
††Dental hygiene clinical examinations.

State	Date	Place	Secretary	Address
Utah			F. E. Lees	324 State Capitol Bldg., Salt Lake City
Vermont			F. A. Reid	Windsor
Virginia			J. M. Hughes	715 Medical Arts Bldg., Richmond 19
Washington			J. B. Kiefer, Jr.	510 Cobb Bldg., Seattle
West Virginia	June 23-25, 1952	West Liberty	C. A. Laughlin	613 Prunty Bldg., Clarksburg
Wisconsin			S. F. Donovan	Tomah
Wyoming			W. J. Ryan	208 Boyd Bldg., Cheyenne

MEETINGS OF OTHER ORGANIZATIONS

Name	Date	Place	Secy. or Chm.	Address
Academy of Denture Prosthetics	Mar. 16-22, 1952	New Orleans	I. L. Furnas Secy.	928 Silverado St., La Jolla, Calif.
American Academy of Dental Medicine	Dec. 2	New York	W. M. Greenhut Secy.	124 E. 84th St., New York 28
American Association of Orthodontists	Apr. 21-24, 1952	St. Louis	G. R. Moore Secy.	919 Oakland Ave., Ann Arbor, Mich.
American Board of Orthodontics	Apr. 16-20, 1952	St. Louis	C. E. Martinek Secy.	661 Fisher Bldg., Detroit 2
Chicago Dental Society	Feb. 4-7, 1952	Chicago	K. S. Richardson Exec. Secy.	30 N. Michigan Ave., Chicago
Council on Dental Education, Division of Aptitude Testing	Mar. 7,8, 1952		S. Peterson Secy.	222 E. Superior St., Chicago 11
Denver Dental Association	Jan. 6-9, 1952	Denver	R. R. Maier Secy.	724 Republic Bldg., Denver 2
Eleventh International Dental Congress	July 19-26, 1952	London, England	D. Downton Hon. Secy.	13 Hill St., London W. 1, England
Great Lakes Society of Orthodontists	Nov. 5-7	Cleveland	C. R. Anderson Secy.	402 Loraine Bldg., Grand Rapids, Mich.
Greater New York Dental Meeting	Dec. 3-7	New York	S. G. Standard Gen. Chm.	Room 106A, Statler Hotel, New York 1
Greater Philadelphia	Jan. 30-Feb. 1, 1952	Philadelphia	R. Adams Secy.	1411 Walnut Street Bldg., Philadelphia 2
International Academy of Anesthesiology	Feb. 6, 1952	New York	I. G. Tomack Secy.	355 E. 149th St., New York 55
Journees Dentaires de Paris, International Congress	Nov. 21-25	Paris, France	R. Rolland Secy. Gen.	15, Boulevard Malesherbes, Paris VIII, France
Midcontinent Dental Congress	Nov. 25-28	St. Louis	J. E. Brophy Exec. Secy.	927 Syndicate Trust Bldg., St. Louis 1
National Board of Dental Examiners	Dec. 3, 4		S. Peterson Secy.	222 E. Superior St., Chicago 11
New Orleans Dental Conference	Nov. 11-14	New Orleans	M. R. Matta Secy.	629 Maison Blanche Bldg., New Orleans
Northwest Conference in Dental Medicine	Apr. 13-17, 1952	Hood River, Ore.	P. L. Meacham, Secy.	426 Medical Arts Bldg., Portland, Ore.
Rocky Mountain Society of Orthodontists	Nov. 5, 6	Denver	D. V. Benkendorf Secy.	932 Metropolitan Bldg., Denver 2
Southern Academy of Oral Surgery	Mar. 22, 23, 1952	Atlanta, Ga.	R. F. Sullivan Secy.	118 E. Jones St., Savannah, Ga.
Southern Society of Orthodontists	Aug. 10-13, 1952	Asheville, N. C.	F. P. Bowyer Secy.	608 Medical Arts Bldg., Knoxville, Tenn.
Third International Dental Congress of Chile	Nov. 18-25	Santiago, Chile	A. Ducheylard Secy. Gen.	P. O. Box 2575, Santiago, Chile
Thomas P. Hinman Mid-Winter Clinic	Mar. 23-26, 1952	Atlanta, Ga.	R. D. Robinson Gen. Chm.	832 Candler Bldg., Atlanta, Ga.



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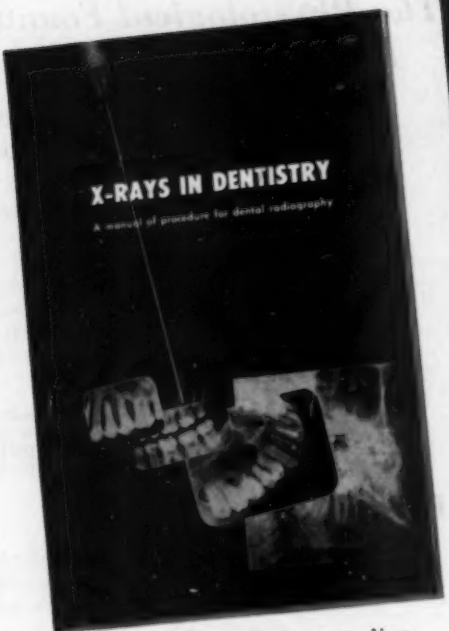

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OPPORTUNITIES AVAILABLE

WANTED—(a) Pedodontist, exodontist, general practitioner; dental group, West; minimum guarantee, $7000.

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(b) Dentist qualified biochemistry or chemistry; research group; university dental school.

(c) Public health dentist; administrative appointment; Pacific Coast.

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(d) Associate; advantageous if interested children's dentistry; busy practice; partnership; college town, Massachusetts.

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(e) Oral surgeon; association with dentist long established university center, Pennsylvania.

The Medical Bureau (cont'd)

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(g) Pedodontist; group appointment; California.

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(h) Full time hospital appointment; Washington.

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(i) Orthodontist; Board qualified or eligible; association with well established practitioner; Illinois.

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(j) Pedodontist to become associated with pedodontist, Michigan.

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(k) General practitioner for following: (1) Association, private practice; Baltimore area; $700-$1000. (2) Association with two dentists; minimum $500; partnership; South Dakota. (3) Association with medical group; Maryland. (4) Association, general practice; partnership, Georgia. (5) Association; general practice; resort city, Arizona. (6) Association; medical group; New England. (7) Industrial contract; full time, Colorado.

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(l) Faculty appointments: dentists experienced or prepared for teaching for following departments: (8) Pedodontia; should be qualified for professorship. (9) Crown and bridge; complete staff required, including chief. (10) Oral and general pathology. (11) Oral Surgery. (12) Operative Dentistry. (13) Prosthodontia and restorative dentistry. (14) Pharmacology, Bacteriology, Histology, Anatomy, Dental Medicine.

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(c) PEDODONTIST; Diplomate, American Board of Pedodontics; six years' private practice; three years' general practice before specializing.

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(d) ORAL SURGEON; three-year residency, university department, oral surgery; eligible for American Board.

●

(e) PROSTHODONTIST; M.S. in Prosthetics; eligible American Board; four years' general practice before specializing.

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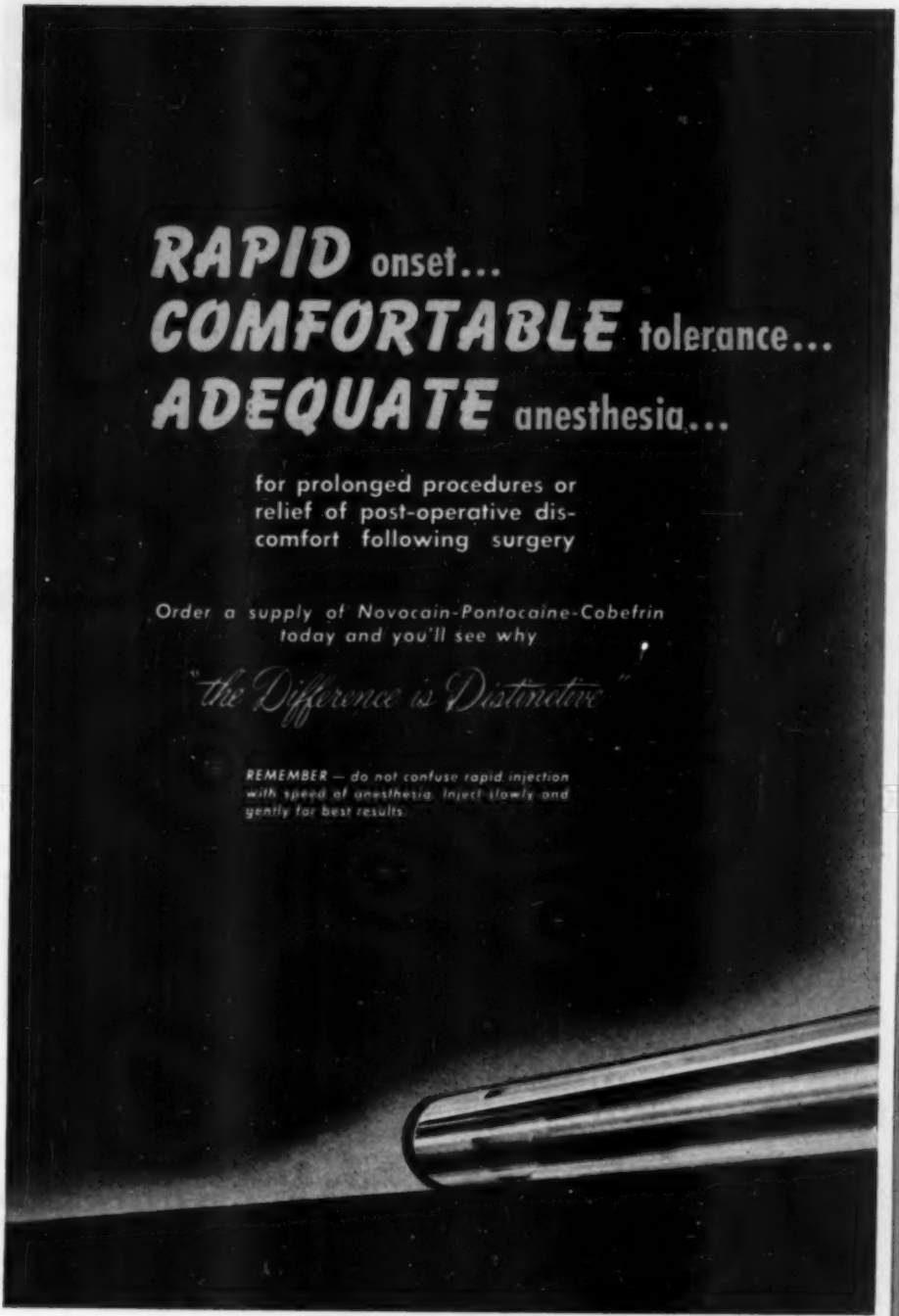
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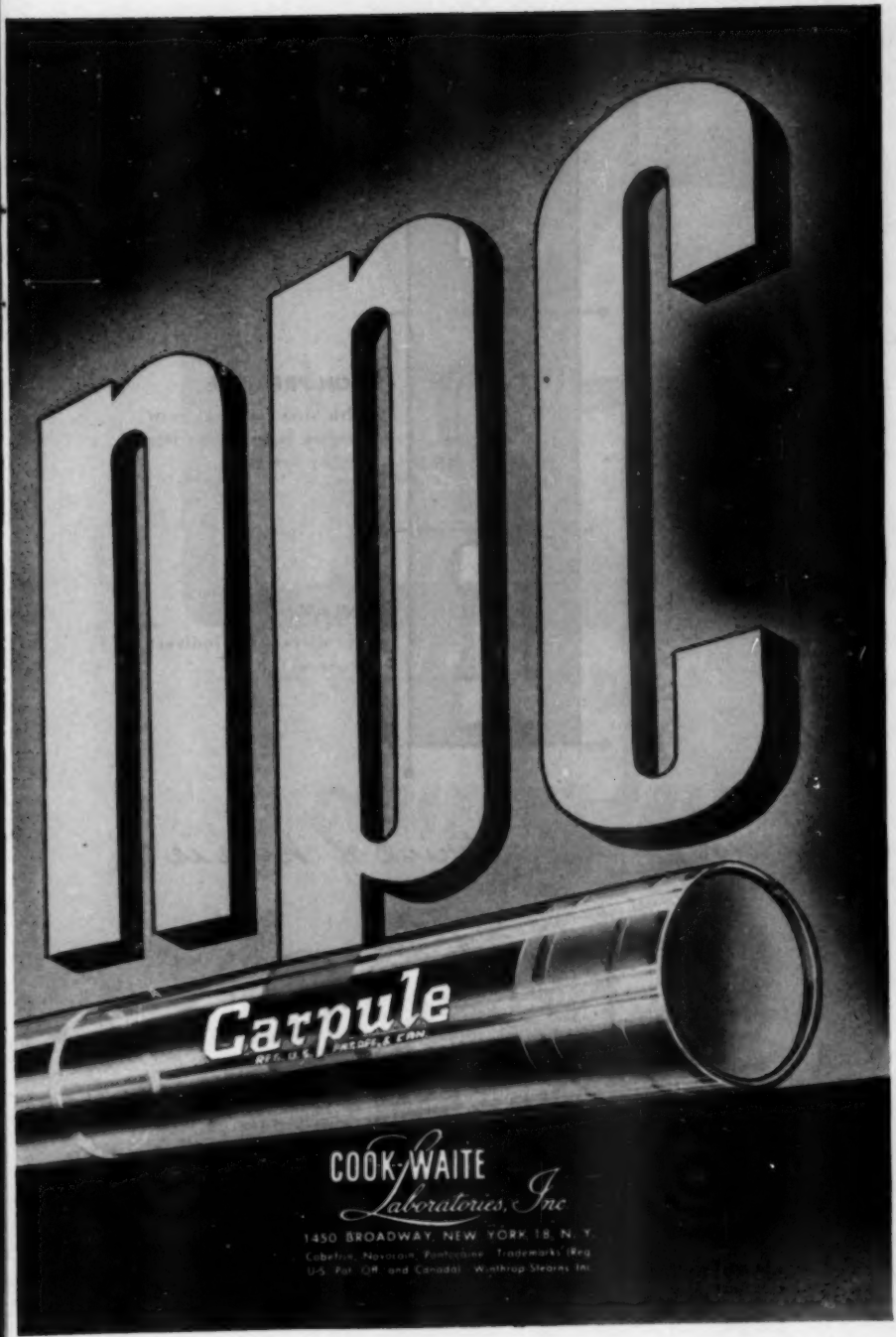
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National Board Examinations

December 3 - 4, 1951
(Applications must be received by Nov. 4, 1951)

April 7 - 8, 1952
(Applications must be received by March 8, 1952)

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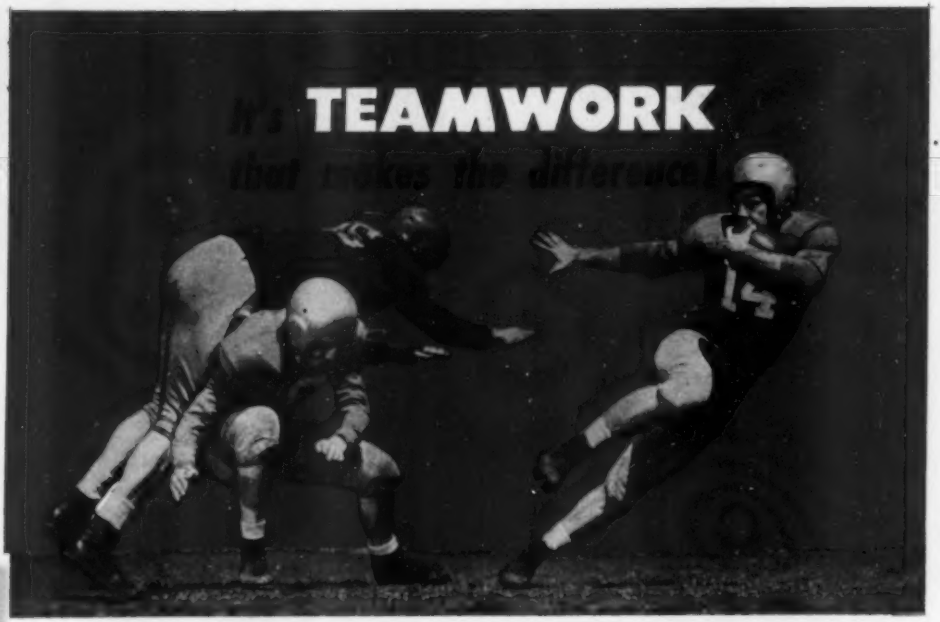

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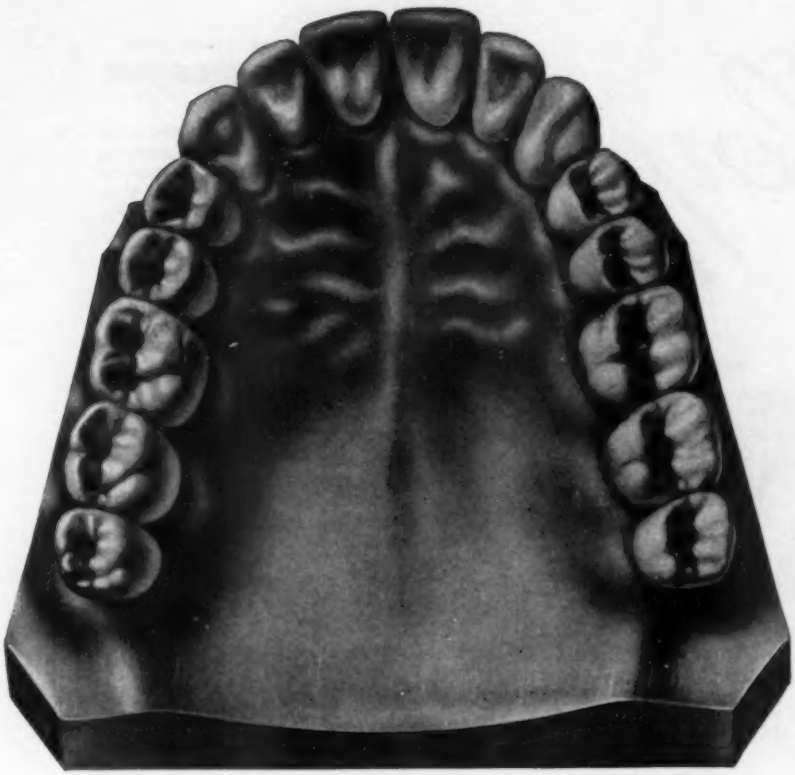

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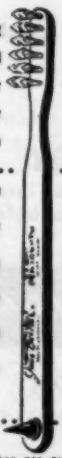

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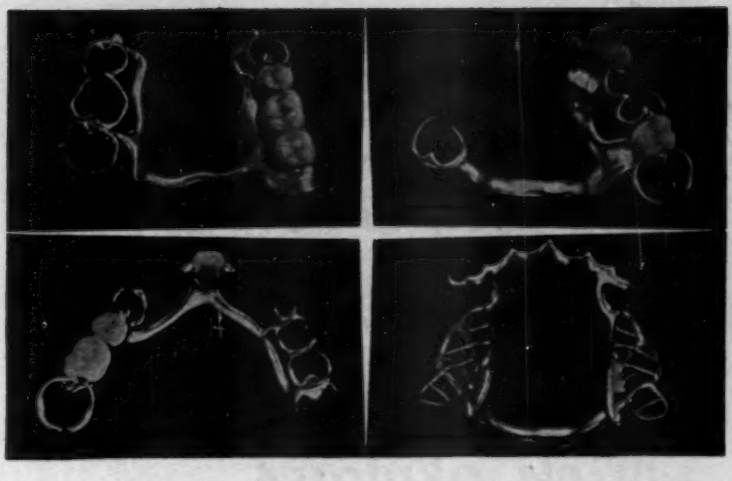

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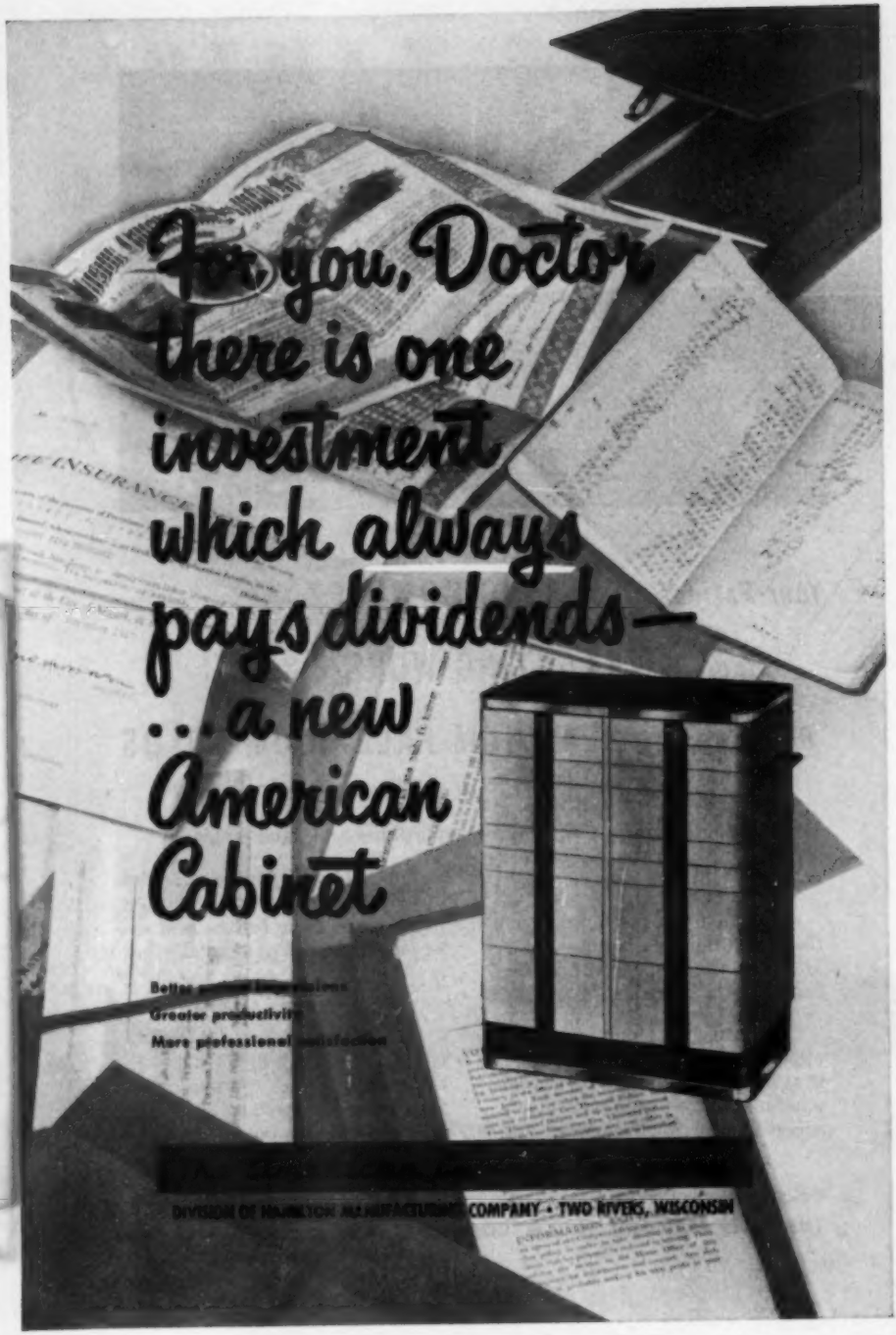
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"hasty or hearty?"

MILK

makes it

a Better Breakfast

The familiar slogan, "a good breakfast starts the day right," is supported by the findings of several recent studies. One such study tested eight different types of breakfasts on adult subjects and measured results in terms of blood-sugar levels and the physiological reactions of the subjects.* The protein and calorie content of the breakfasts varied.

After breakfasts that furnished 7 to 17 gm. of protein and 360 to 520 calories, the blood-sugar rose rapidly during the first half hour and returned to the original fasting level in three hours. After breakfasts which provided about 500 calories and 22 gm. of protein, derived chiefly from the animal sources, milk or eggs, the blood-sugar rise was normal, but the average maximal figure was lower and the return to fasting level was delayed beyond the usual three-hour period.

The sustained blood-sugar levels were associated with favorable physiological responses of the subjects. A sense of physical well-being was reported consistently following breakfasts that provided the larger quantities of protein-rich food.

Milk's contribution to the morning meal was demonstrated in one of the test breakfasts. By adding slightly more than a glass of milk to a low protein breakfast of about 350 calories, blood-sugar levels were longer sustained and the meal was more satisfying to the subjects than was the basic meal. The milk supplied not only the additional protein and food energy, emphasized in the present study, but provided many other nutrients needed for good nutrition.

It is evident from these findings that important nutritive changes in breakfast can be made with little variation in menu and with almost no effort. A glass of milk, for example, can make the difference between a good and a poor breakfast without adding materially to the time required either to prepare or to eat the meal.

*Orent-Keiles, E. and Hallman, L. F. *The breakfast meal in relation to blood-sugar values.* U. S. D. A. Circular No. 827 (Dec.) 1949.

The presence of this seal indicates that all nutrition statements in the advertisement have been found acceptable by the Council on Foods and Nutrition of the American Medical Association.

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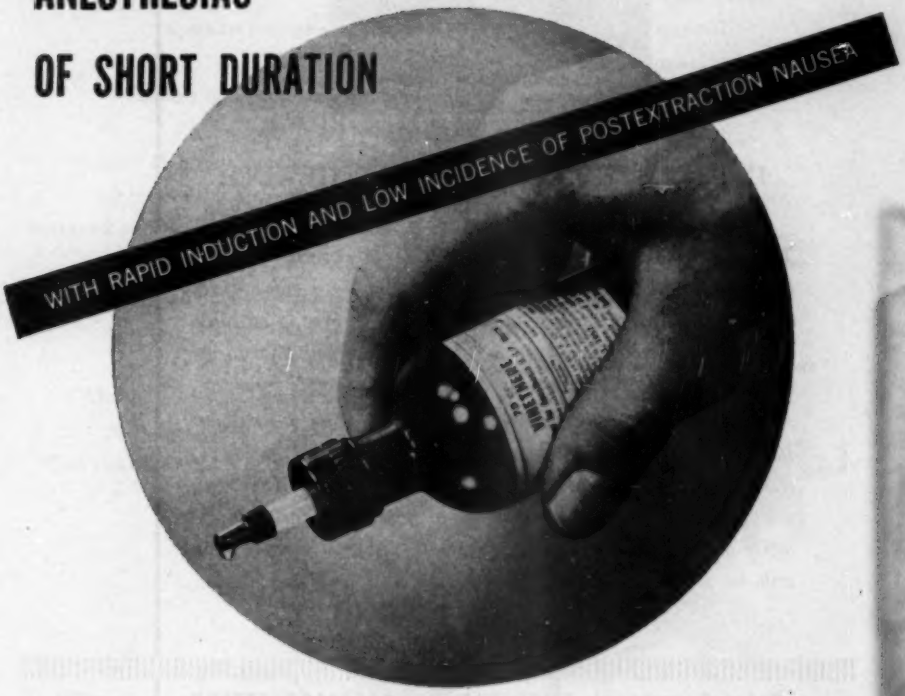

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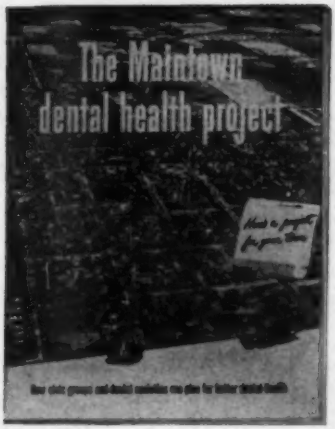

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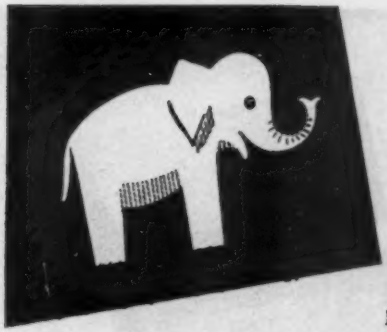

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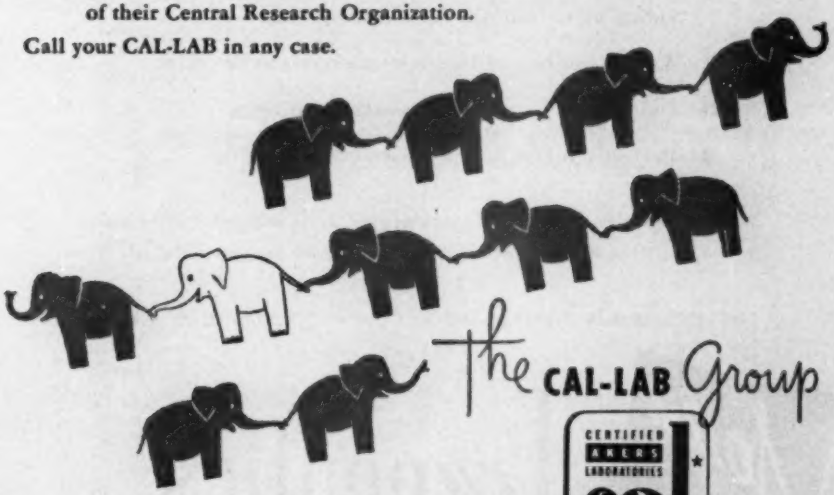

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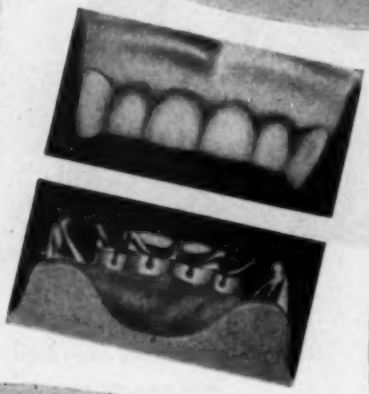

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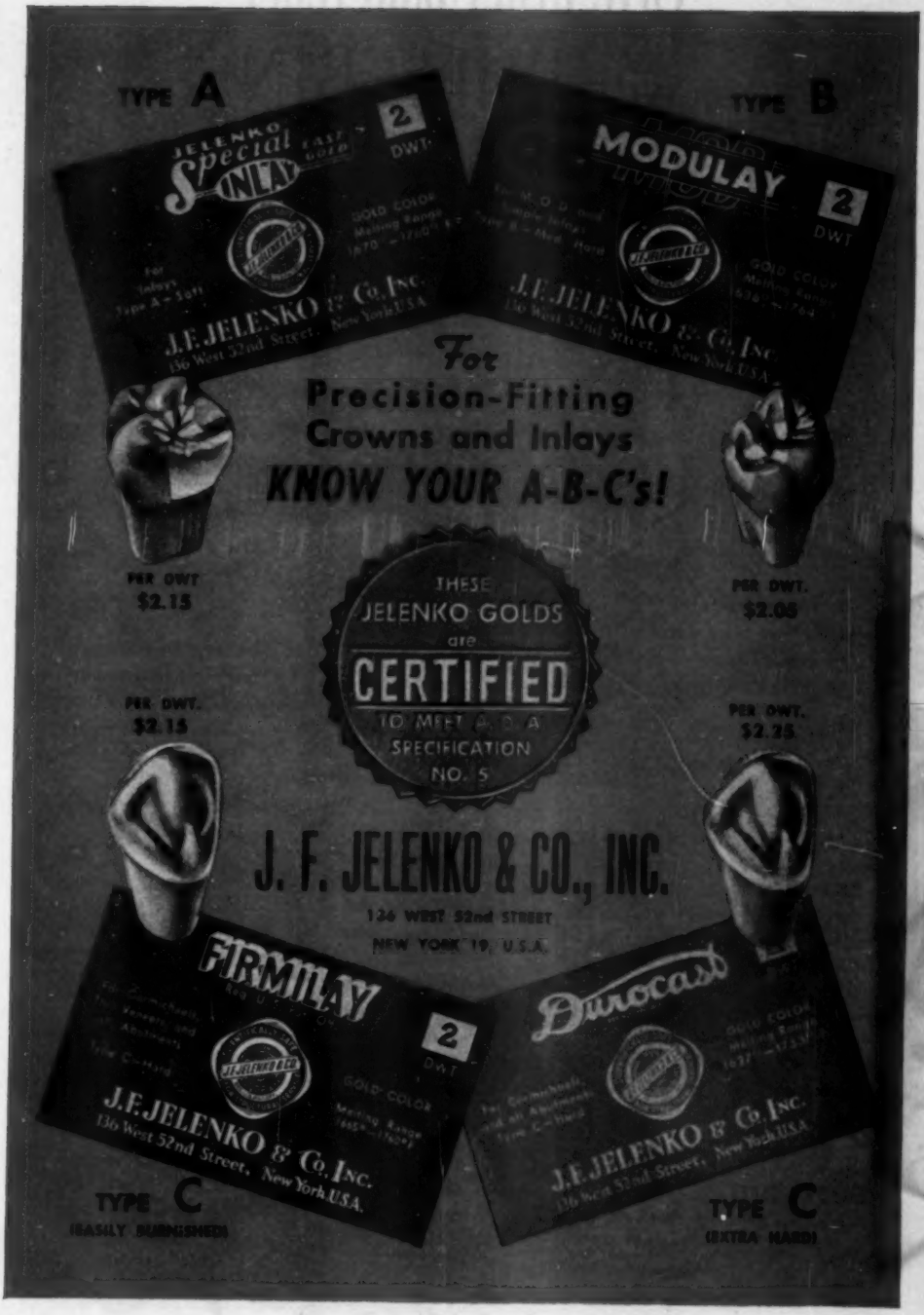
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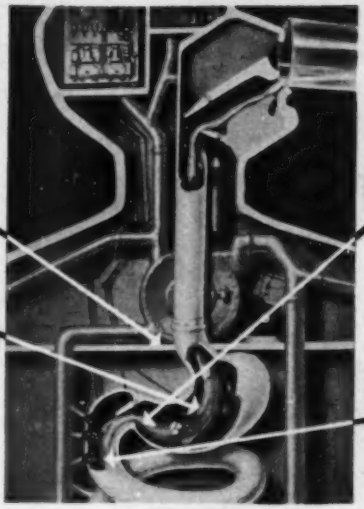

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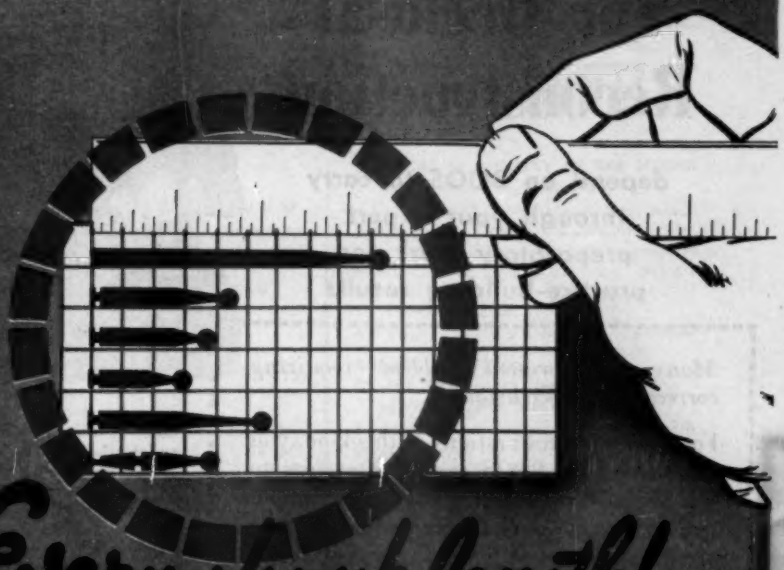

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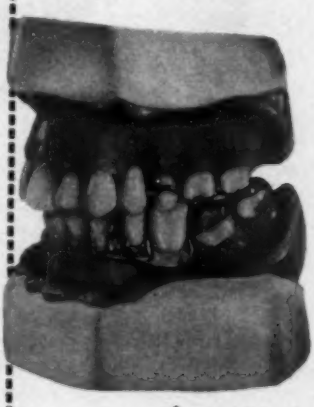

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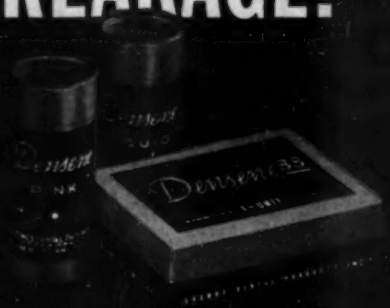

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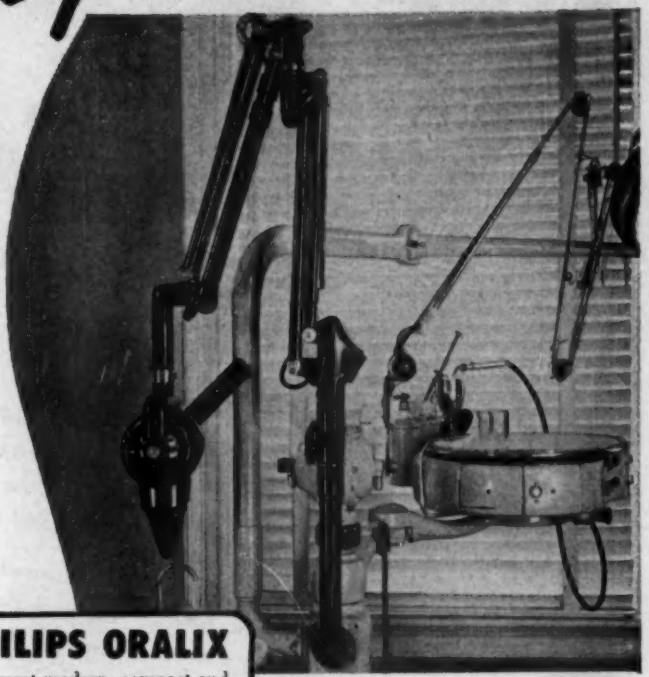

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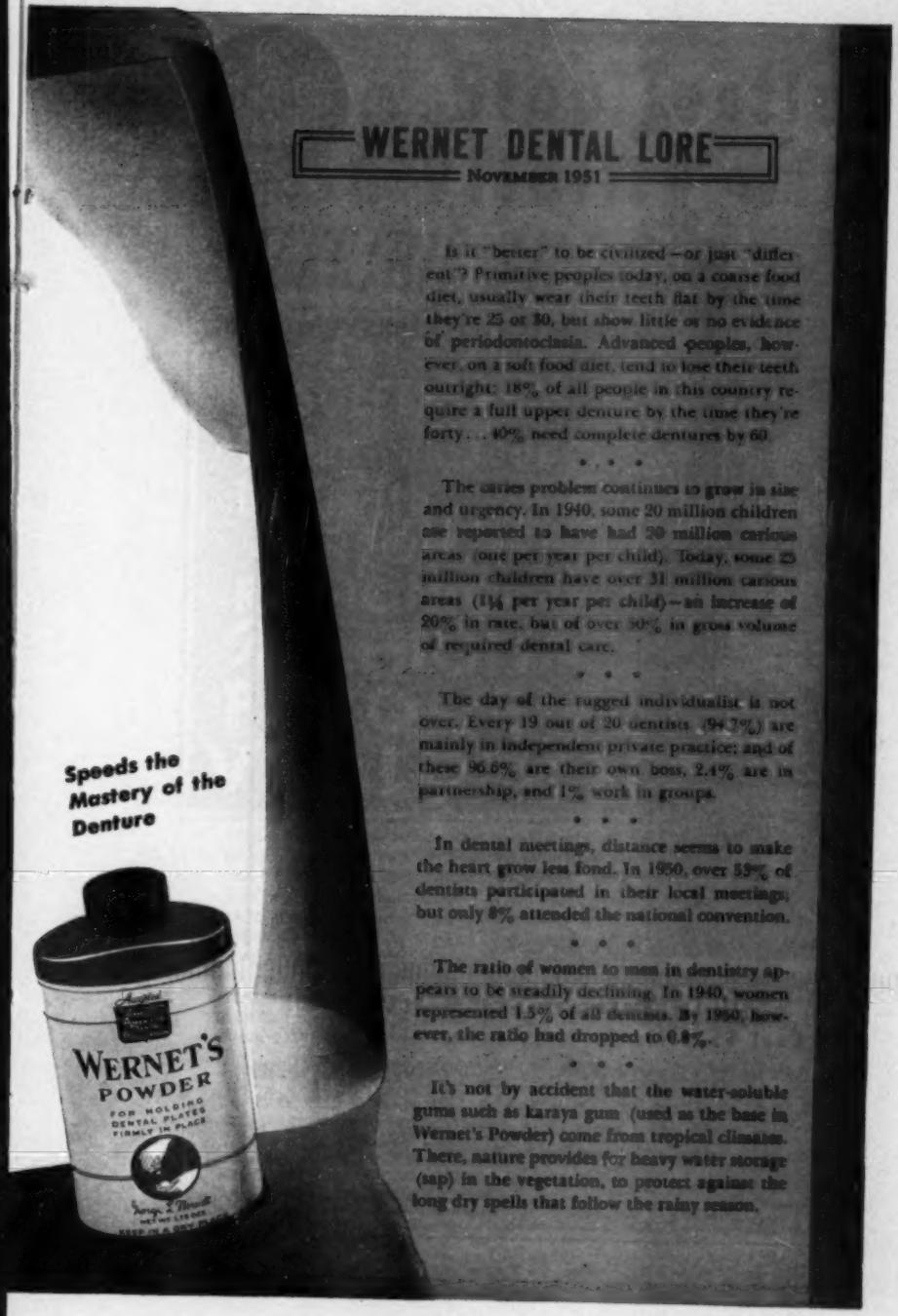
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NOVEMBER 1951
Is it "better" to be civilized—or just "different"? Primitive peoples today, on a coarse food diet, usually wear their teeth flat by the time they're 25 or 30, but show little or no evidence of periodontoclasia. Advanced peoples, however, on a soft food diet, tend to lose their teeth outright: 18% of all people in this country require a full upper denture by the time they're forty... 40% need complete dentures by 60.
• • •
The caries problem continues to grow in size and urgency. In 1940, some 20 million children are reported to have had 20 million carious areas (one per year per child). Today, some 25 million children have over 31 million carious areas (1¼ per year per child)—an increase of 20% in rate, but of over 50% in gross volume of required dental care.
• • •
The day of the rugged individualist is not over. Every 19 out of 20 dentists (94.2%) are mainly in independent private practice; and of these 96.6% are their own boss, 2.4% are in partnership, and 1% work in groups.
• • •
In dental meetings, distance seems to make the heart grow less fond. In 1950, over 55% of dentists participated in their local meetings; but only 8% attended the national convention.
• • •
The ratio of women to men in dentistry appears to be steadily declining. In 1940, women represented 1.5% of all dentists. By 1950, however, the ratio had dropped to 0.8%.
• • •
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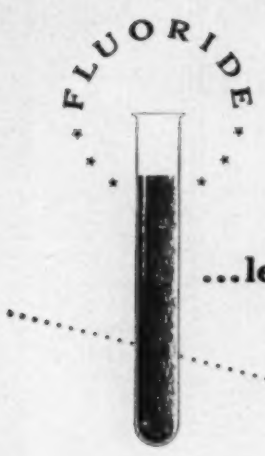

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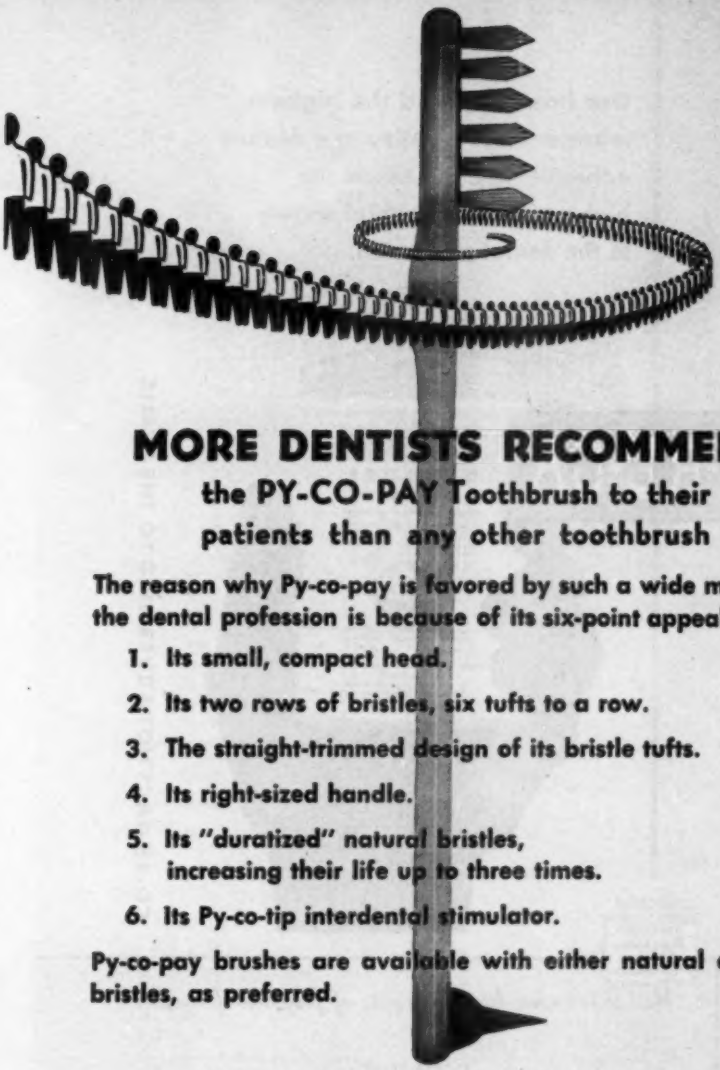

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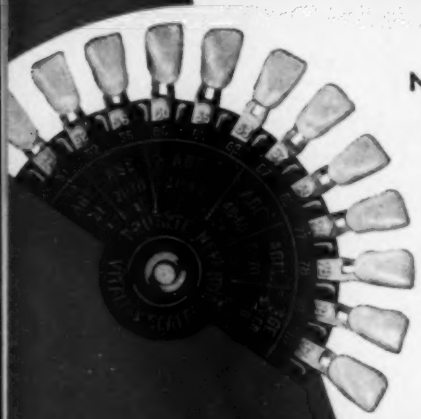

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